National Park Service
U.S. Department of the Interior

Gateway National Recreation Area
Sandy Hook Unit
New Jersey

ENVIRONMENTAL ASSESSMENT

Multiuse Pathway

August 2002

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Environmental Assessment

Multiuse Pathway

Sandy Hook

Gateway

National Recreation Area

United States Department of the Interior • National Park Service

Environmental Assessment

Multiuse Pathway

Gateway National Recreation Area
Sandy Hook
Monmouth County, New Jersey

The National Park Service is proposing to construct a multiuse pathway from the fee plaza near the southern entrance to the Sandy Hook Unit of Gateway National Recreation to Fort Hancock and the northern beach centers. The primary purposes of the project are to improve safety by separating pedestrians, bicyclists, and other nonmotorized visitors from automobile traffic, to provide a great recreational amenity for park visitors, and to encourage alternative means of experiencing the park. The proposed project would entail construction of a paved, 12-foot wide pathway along an alignment generally parallel to Hartshorne Drive.

This *Environmental Assessment* (EA) has been prepared in accordance with the National Environmental Policy Act and the National Historic Preservation Act to evaluate the impacts of the project on the human environment and provide an opportunity for the public to review and comment on the project. This EA serves as notification to the public of proposed actions, consistent with Sec. 800.2(d) of Title 36, Code of Federal Regulations, and seeks the views of the public and all consulting parties on the effects, if any, on historic properties, in accordance with Sec. 800.5 of Title 36 Code of Federal Regulations.

Note to Reviewers and Respondents:

If you wish to comment on this *Environmental Assessment*, you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Written comments should be submitted within 30 days and should be addressed to:

Russel Wilson, Superintendent
Sandy Hook Unit
Gateway National Recreation Area
POB 530
Fort Hancock, NJ 07732

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PURPOSE AND NEED

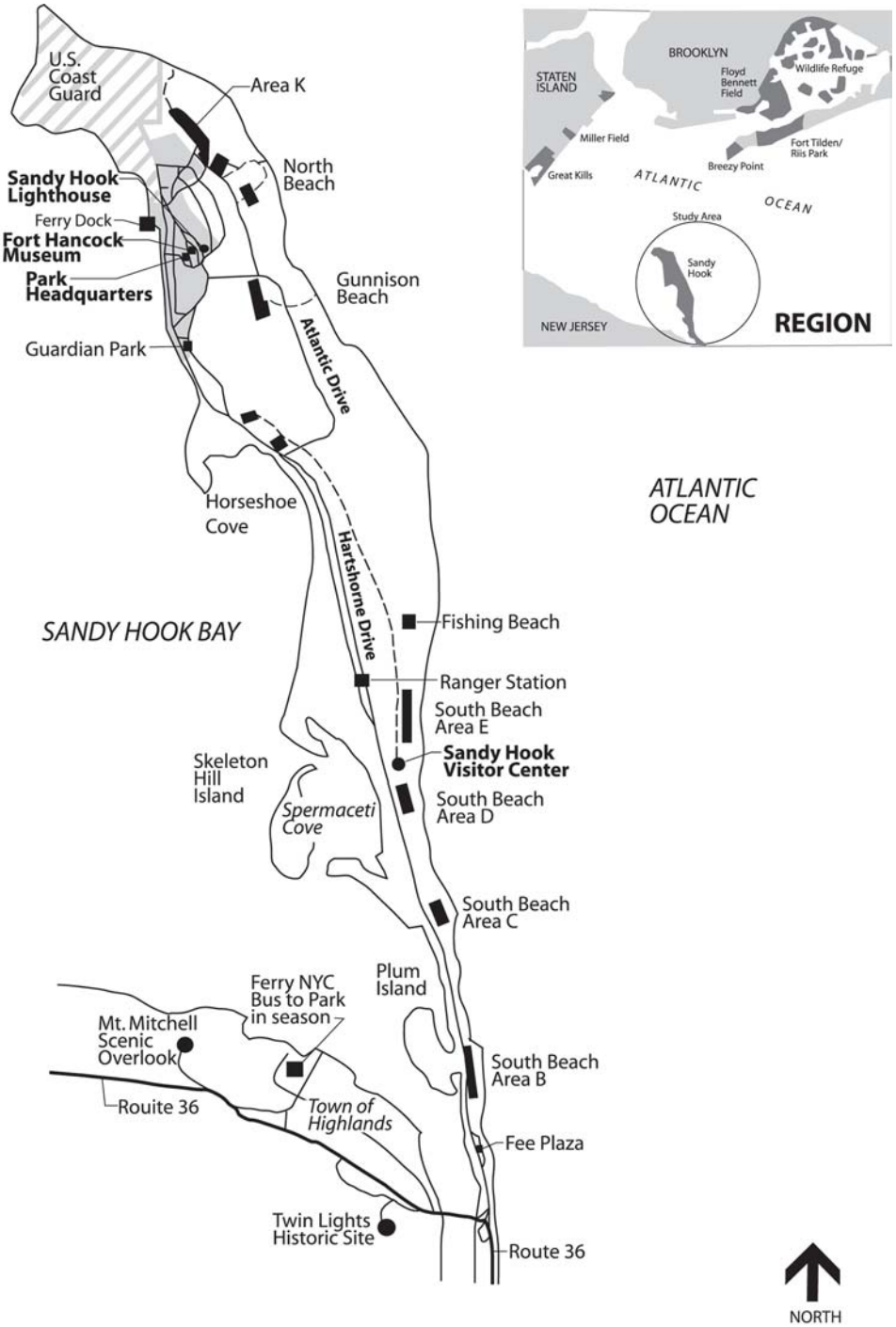
The National Park Service (NPS) proposes to construct a multiuse pathway at the Sandy Hook Unit of the Gateway National Recreation Area in Monmouth County, New Jersey (see Figure 1). The pathway would support a variety of nonmotorized activities, including walking, jogging, skating, and bicycling. The primary purpose of the project is to increase visitor safety by separating motorized visitors from nonmotorized visitors. In general, accidents and incidents between vehicular and nonvehicular users have increased in recent years, some of which have resulted in death or serious injury. For instance, a bicyclist on Hartshorne Drive was struck and killed by an automobile in 1996. Currently, bicycling is not promoted at the park due to safety factors, and skating is prohibited along some park roads. The project is needed to increase safety and reduce the number of accidents between visitors in motorized vehicles and nonmotorized visitors, particularly along Hartshorne Drive. The project also would provide recreational opportunities for visitors to experience the park in a nonmotorized setting by safely accommodating pedestrians, joggers, and bicyclists, and permitting the park to promote nonvehicular touring and access to the beaches and other areas of interest, including Fort Hancock. The Henry Hudson Trail under development will bring more users to the park entrance. Without separate facilities, these users would be required to use Hartshorne Drive. Hartshorne Drive has no paved shoulders and cyclists that pull off the roadway to avoid cars usually fall over because of the soft sand.

This EA presents the impacts of this proposal on the environment in accordance with federal regulations, including, but not limited to: the *National Environmental Policy Act of 1969* (NEPA), *Council on Environmental Quality Regulations* (Title 40 Code of Federal Regulations Part 1500 et sequentia), the *National Historic Preservation Act* of 1966, as amended (NHPA), the *Advisory Council on Historic Preservation's Revised Regulations, Protection of Historic Properties*, (Title 36 Code of Federal Regulations, Part 800), effective January 11, 2001, *NPS Management Policies 2001*, Director's Order 28 *Cultural Resource Management Guideline* (1998), and Director's Order 12, *Conservation Planning, Environmental Impact Analysis and Decision-making* (2001).

BACKGROUND

Project Setting

Gateway National Recreation Area was established in 1972 (PL 92-592) "to preserve and protect for the use and enjoyment of present and future generations an area possessing outstanding natural and recreational features," The Recreation Area comprises lands, waters, and marshes in the New York Harbor area. The Sandy Hook Unit (the park) extends from the New Jersey Highway 36 Bridge at Atlantic Highlands, northward to include the entire peninsula (approximately 1,700 acres). The park lies at the northern end of New Jersey's barrier island system. Approximately 12 miles of ocean and bay shoreline ring the peninsula, which varies in width from less than one-tenth mile to approximately 1 mile.



VICINITY
Sandy Hook

Gateway National Recreation Area
National Park Service
U.S. Department of the Interior
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Situated adjacent to one of the most densely developed urban areas in the United States, the park preserves one of the relatively undisturbed barrier island ecosystems in New Jersey, and supports multiple historic sites and natural habitats. The entire park is a national historic landmark. Over 200 historic structures remain standing in the park with approximately 130 of these located within the Fort Hancock Area. Current tenants at the park include the National Oceanic and Atmospheric Administration, New Jersey Marine Sciences Consortium, Brookdale Community College, and the Marine Academy of Science and Technology. The U.S. Coast Guard maintains an installation at the northern tip of the Sandy Hook peninsula, immediately adjacent to the park, which includes approximately 300 military personnel and dependents. In addition to cultural and natural resources, the park provides recreational facilities, including opportunities for swimming, sunbathing, picnicking, birdwatching, beach-combing, surfing, hiking, and fishing. More than 2 million people visit the park every year.

Relationship to Existing Plans

The park currently is managed under a 1979 *General Management Plan* (NPS 1979) that was amended in 1990 (NPS 1990). Among other actions, the 1979 plan proposed that visitors arriving by bicycle utilize a trail that parallels the main road as far north as the Nike radar site and then follow Atlantic Drive (which would be closed to traffic). Bicycle use would be encouraged within the unit, and connecting secondary paths would be developed wherever appropriate and environmentally acceptable (NPS 1979). The 1979 *General Management Plan* (GMP) proposed development of a bike pathway along the east side of Hartshorne Drive (NPS 1979). The preferred alternative evaluated in this EA would further the goals of the GMP by providing a pathway designed to accommodate bicycle and nonmotorized access throughout the park, within the general framework of pathways described in the GMP. The park's 1990 Amendment to the 1979 GMP reiterated the park's goal of providing increased bicycle access to and within the park.

In addition to the amended GMP, Gateway National Recreation Area completed the 1997 *Strategic Plan*, which specified goals and targets within its units, including Sandy Hook (NPS 1997). Strategic plan goals include improving visitor satisfaction, improving park facilities, restoring disturbed lands, and improving the condition of cultural and natural resources. The preferred alternative evaluated in this EA supports the goals and objectives of the strategic plan, including enhancing visitor satisfaction and safety.

The park has completed a management plan for the federally threatened and state endangered (*Charadrius melodus*) (NPS 1992). The Piping Plover management plan recommends limiting human disturbance, protecting essential habitats, and implementing actions proposed by the U.S. Fish and Wildlife Service. The preferred alternative evaluated in this EA has been designed to limit disturbance to piping plovers and has incorporated recommendations proposed through informal consultation with the U.S. Fish and Wildlife Service.

The New Jersey Department of Transportation (NJDOT) has awarded more than $7,000,000 in grants to construct approximately 54 miles of bicycle paths throughout New Jersey. The purpose of the State's bicycle-pathway program is to enhance recreational opportunities and improve the quality of the environment. The 19-mile Henry Hudson Trail now being developed by the Monmouth County Park System will extend from Matawan to Sandy Hook. The trail is complete to Atlantic Highlands. The segment between Atlantic Highlands and Highlands is being designed. Monmouth County and the park are collaborating with NJDOT

to incorporate a connection between Highlands and Sandy Hook in the design for the anticipated Highlands Bridge replacement.

Projects recently completed or currently in progress at the park include: rehabilitation of the interior and roof of the Post Theater (Building 67); rehabilitation of Buildings 58 as interim park headquarters; rehabilitation of World War II Barracks (Buildings 119\120); installation of fire-safety features at Building 102; elevation of Hartshorne Drive; removal and replacement of numerous under-ground and above-ground fuel storage tanks at various locations; installation of underground water lines in the Hartshorne Drive Corridor; and upgrade of waste-water utilities. These projects are scheduled for 1999-2003. Rehabilitation of the Sandy Hook Lighthouse and barn, a national historic landmark, was completed in the summer of 2000.

Future actions under consideration include: beach replenishment just north of Area C using sand from Gunnison Beach, carried by pipeline; development of a visitor center and museum in Building 25; rehabilitation of water and other utility systems; redesign of the entrance plaza in coordination with the construction of a new Highlands Bridge; installation of a natural gas pipeline and burial of electrical lines; and construction of a permanent ferry dock. The ferry dock will provide alternative transportation to the park. The beach replenishment project would increase beach width in the severely eroded "critical zone" to minimize the hazard of a permanent breach of the peninsula and to maintain vehicle access to the park. The beach replenishment project also would maintain recreational beaches north of the critical zone and increase protection to recently completed beach facilities. Rehabilitation of the park's water and other utility systems would improve the reliability of water and wastewater systems throughout the park, and is expected to begin in 2002. Work on Building 25 as the visitor center and museum is expected to begin in 2004. Work by the State on the Highlands Bridge is expected to begin in 2005.

On February 15, 2002 the park issued a draft "Environmental Assessment for the Adaptive Use of the Fort Hancock and Sandy Hook Proving Ground National Historic District." The environmental assessment was developed in response to the anticipated adaptive rehabilitation and leasing of 37 historic buildings within Fort Hancock for a mixed use of office, educational and hospitality functions. The Fort Hancock Environmental Assessment is now in review. The actions proposed in the Sandy Hook Multiuse Pathway EA are compatible with proposals outlined in the Fort Hancock EA.

ISSUES

The primary issues involved associated with the preferred alternative considered in this EA are: (1) visitor safety is compromised by incompatible use of the roadways in the park; (2) desire to provide additional recreational opportunities as identified in the park's general management plan (3) sensitive resources must be preserved and protected, and (4) alternative transportation access is lacking within the park.

To address these issues, the preferred alternative would be designed to

(1) improve safety by reducing conflicts and accidents between bicyclists, pedestrians, and automobiles

(2) minimize adverse impacts to natural resources and cultural resource elements that contribute to the national historic landmark
(3) create a new, high quality recreational amenity in the park that provides visitors with a healthy, enjoyable, outdoor recreational experience
(4) provide nonmotorized public access to the park.

IMPACT TOPICS

Issues and concerns affecting the preferred alternative were identified by specialists in the National Park Service, as well as by the office of the New Jersey State Historic Preservation Office (SHPO) and others. Impact topics are the resources of concern that could be affected by the range of alternatives. Specific impact topics were developed to ensure that alternatives were compared on the basis of the most relevant topics. The following impact topics were identified on the basis of federal laws, regulations, orders, and National Park Service *Management Policies, 2001*, and from input by the SHPO and others. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

Sand Dunes

As part of the coastal management program for New Jersey, sand dunes are an important feature that occurs in the project area and may be affected.

Plant Communities

The plant communities at Sandy Hook represent a diverse array of vegetation. The loss of communities and their relative importance needs to be analyzed to quantify the extent of change associated with the project.

Piping Plover

Piping plover is listed by the Fish and Wildlife Service as threatened under the Endangered Species Act and found in the project area. This species could be affected and for that reason is included in the analysis.

Least Tern

The least tern is listed by the state of New Jersey as threatened under the Endangered and Non-game Species Conservation Act and found in the project area. This species could be affected and for that reason is included in the analysis.

Osprey

The osprey is listed by the state of New Jersey as threatened under the Endangered and Non-game Species Conservation Act and found in the project area. This species could be affected and for that reason is included in the analysis.

Wild Wormwood

Wild wormwood is listed by the state of New Jersey as threatened under the Endangered and Nongame Species Conservation Act as threatened and found in the project area. This species could be affected and for that reason is included in the analysis.

Archeology

Humans have used Sandy Hook for many centuries and the potential exists to affect archeological resources by constructing a multiuse pathway.

Historic Properties and Structures

Since the 18th century, Sandy Hook has been used actively for maritime purposes, as a military proving ground, and for defense purposes. Numerous structures are present and listed as a National Historic Landmark. It is important to identify any impacts to properties and structures eligible or listed in the National Register of Historic Places.

Cultural Landscapes

The long military association and maritime use has created a cultural landscape that encompasses most of the peninsula. The effects to this landscape need to be identified so informed decisions are made regarding future use.

Visitor Experience

One of the purposes of the park is for use and enjoyment. How the visitor experiences the park is important and is analyzed to identify the effects of the alternatives.

Visitor Safety

Visitor safety is an important element of the NPS mission and there is a safety problem associated with incompatible use of roadways by bicyclists. This topic is included to identify how the alternatives address visitor safety.

IMPACT TOPICS DISMISSED FROM FURTHER ANALYSIS

The topics listed below either would not be affected or would be affected negligibly by the actions evaluated in this EA. Therefore, these topics have been dismissed from further consideration or analysis. Negligible effects are effects that are localized and immeasurable or at the lowest levels of detection.

Wetlands

Although there are wetlands adjacent to the project area, these would not be impacted by either alternative. As a result, this impact topic was dismissed from further analysis.

Species of Concern

The northeastern beach tiger beetle, bald eagle, roseate tern, and sea beach amaranth were identified as occurring at the park. These species are either outside the project area and would not be affected or occur as transients that do not forage, roost, or nest in the project area and would not be affected. Mitigation for the piping plover at the North Beach nesting area would afford protection (from indirect impacts) for the northeastern beach tiger beetle.

Geology and Soils

Substrates in the park consist of recent depositions of sand, gravel, silt, clay, and organic material with sand typically dominating soil composition. Soils at the park exhibit high permeability, low capacity to retain water, low shrink-swell potential and low compressibility. Although pathway construction would entail minor grading in some locations, no soils would be removed from or distributed to other areas of the park. The alternatives being considered in this EA would not affect soil properties, including permeability, water retention capacity, or compressibility.

Prime and Unique Farmlands

In August 1980 the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts.

According to the New Jersey State Office of the U.S. Department of Agriculture's Natural Resource Conservation Service, no prime or unique farmlands are present in the park (D. Smart, personal communication).

Water Quality

The proposal would have little if any effect on water quality**.** It is expected that the materials used to construct the pathway (asphalt) would not degrade water quality at the park. No run-off would enter or otherwise affect water quality in Sandy Hook Bay, nor affect the quality of potable water available to the park or nearby communities. Drinking water is pumped from contained aquifers hundreds of feet below the surface.

Air Quality

No public transit system provides transportation to the park. Therefore, most visitors access the park is via private vehicles, which contribute to ambient levels of carbon monoxide, hydrocarbons, nitrogen oxides, and particulate matter. Carbon monoxide and hydrocarbon emissions are of particular concern, because those pollutants have not continuously met National Ambient Air Quality Standards in the region (NPS 1994). Traffic congestion and elevated emissions are particularly acute during hot, summer weekends at the peak of park visitation. Parking capacity is limited and vehicular traffic will not increase beyond that level. None of the alternatives evaluated in this EA would increase traffic congestion, although the

proposal may result in reduction of vehicle use. The potential reduction in traffic would be negligible and would reduce emissions slightly.

Hauling material, operating equipment, and other construction activities could result in temporarily increased vehicle exhaust and emissions. However, hydrocarbons, NO_x, and SO_2 emissions, as well as any airborne particulates created by fugitive dust plumes, would be rapidly dissipated. Overall, there could be a negligible degradation of local air quality due to construction; however, such effects would be temporary, lasting only as long as construction. Sandy Hook's overall air quality would be unaffected by the proposal.

Floodplains

Most of Sandy Hook Unit lies within the 100-year floodplain, which is accepted to be the area covered by floodwaters 10.8 feet above mean sea level (MSL) (NPS 1976). A flood of this intensity has a 1% chance of occurring in any given year. Although portions of the alignment of the multiuse pathway would be in the 100-year floodplain, the proposal would not increase the risk of loss of life or property. No occupancy, storage of archeological or cultural resources, or storage of fuel or sewage treatment plants are associated with this project. Although much of the preferred alternative is located within the 100-year floodplain, the project would not reduce the capacity, function or natural values of the floodplain. The NPS floodplain guideline does not apply to park functions that are often located near water for the enjoyment of visitors and that do not involve overnight occupation (NPS 1993). This action falls within that guideline.

Environmental Justice

The project is adjacent to one of the most densely populated urban areas in the United States. Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Implementation of the preferred alternative would have negligible effects on human health or the environment of minorities or socially or economically disadvantaged populations. People without automobiles could safely reach Sandy Hook by bicycle.

Social and Economic

The following social and economic factors were considered: regional economic base, employment, housing, land-use requirements, community service requirements, plans of other agencies, income, community costs, population dynamics, social institutions, ways of life, land tenure, and legal considerations. They were discounted from further evaluation because the alternatives would not affect them or would have a negligible effect on them.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable

fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian Trust Resources associated with this project.

Soundscape Management

In accordance with National Park Service *Management Policies* (2001) and Director's Order #47, *Sound Preservation and Noise Management*, an important part of the National Park Service mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and duration of human-caused sound considered acceptable varies among National Park Service units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. Motorized vehicles that introduce noise to the soundscape heavily use the project area. The project would have no noticeable effect on the natural soundscape at Sandy Hook.

Lightscape Management: In accordance with National Park Service *Management Policies* (2001), the National Park Service strives to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human caused light.

ALTERNATIVES

BACKGROUND

Gateway National Recreation Area is currently managed under the *General Management Plan* (NPS 1979), which was amended in 1990 (NPS 1990). The plans focused on providing a mix of outdoor and indoor recreation, conservation and environmental protection, and year-round educational, cultural, and recreational programs.

This *Environmental Assessment* (EA) evaluates alternatives for implementing the concept of a multiuse pathway at Sandy Hook, which is one aspect of the approved 1979 GMP.

The National Park Service began planning for the multiuse pathway in early 2000. With the assistance of the Denver Service Center, the park held planning sessions during the year to identify resources of concern, management issues, important user needs, preliminary design considerations, and potential alignments. In February of 2001 a Value Analysis Workshop was conducted in the park to evaluate alternatives and options with regard to the most effective use of public funds to construct the path.

Funding for this project is available beginning in FY 2002. Construction as described in the preferred alternative (below) likely would begin in the spring of 2003, would be interrupted during the summer of 2003, would resume in the fall of 2003, and would be completed during the winter of 2004.

Two alternatives are presented in this document. The no-action alternative is analyzed to show the effect if no action were taken and as a baseline for comparing the action alternative. The preferred alternative represents the only reasonable method of meeting the purpose and need identified earlier, in light of resource protection issues.

NO ACTION ALTERNATIVE

A multiuse pathway that links the adjacent Sea Bright and Henry Hudson municipal pathways, the entrance of the park, the southern beach centers, the Fort Hancock Historic District, the ferry dock, and the northern beach centers would not be constructed. Bicyclists would continue to share road space with high numbers of vehicles. The 800,000 vehicles that enter the park each year use Hartshorne Drive. Under this alternative the long-standing safety concerns would not be addressed.

CONSTRUCT A MULTIUSE PATHWAY (PREFERRED ALTERNATIVE)

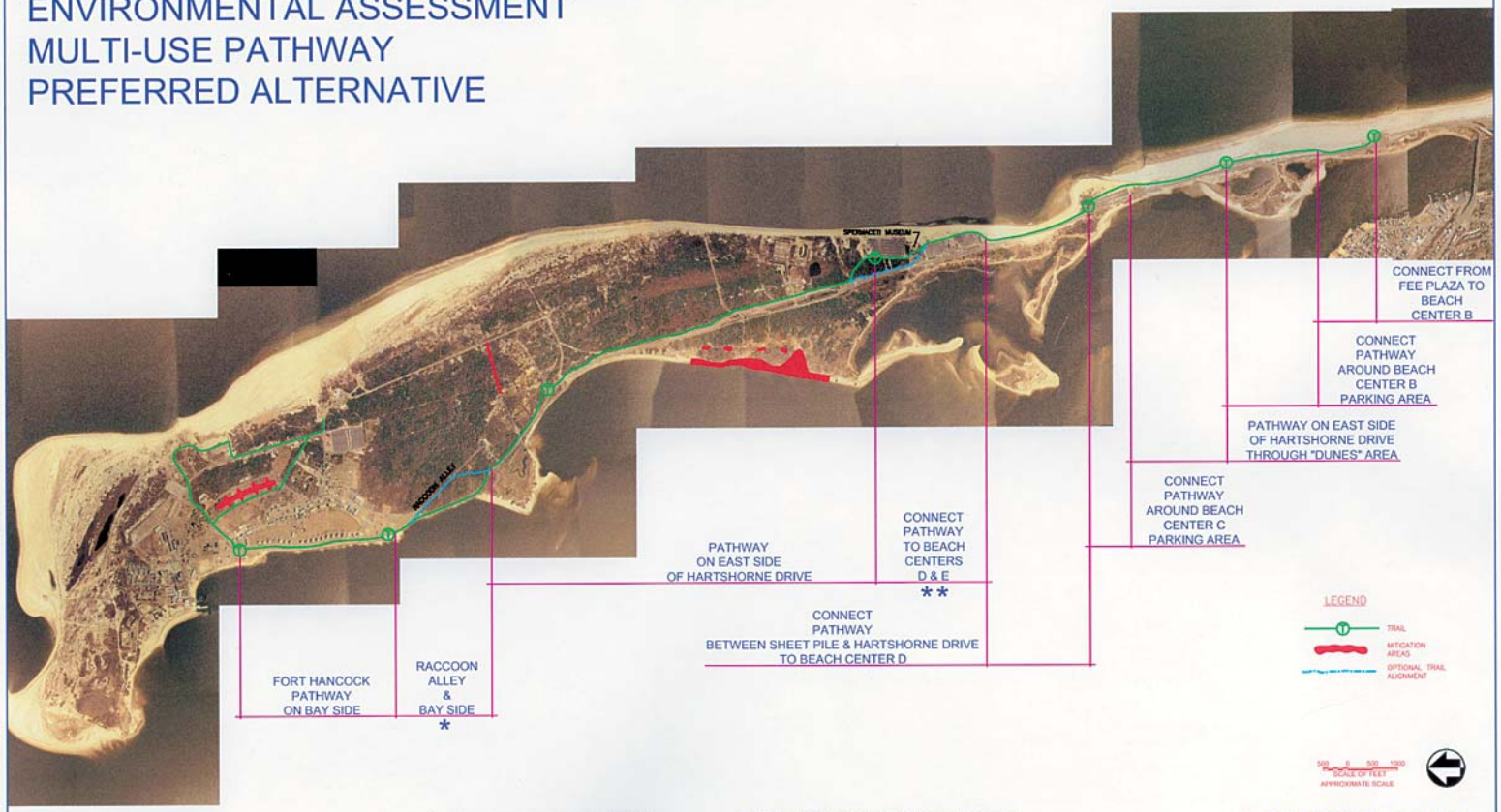
The National Park Service proposes to construct a multiuse pathway from the south boundary of the park to the proposed ferry terminus at Ft Hancock (see Figure 2: Preferred Alternative). The pathway would be 12 feet wide and have 2-foot shoulders on either side, for a total width of 16 feet. The construction corridor would be a maximum of 20 feet wide (Figure 3). The types of uses permitted would be biking, walking, jogging, and skating. Motorized and equestrian use would not be permitted. The pathway would generally follow the east side of

Hartshorne Drive. Once at Ft Hancock, pathway users would have access to the Gunnison and North Beach Areas. The pathway accessing the beaches would be on existing walkways, roadways, former roadways and in disturbed areas. The *Guide to the Development of Bicycle Facilities* (AASHTO, 1999) recommends that two-directional pathways be 12 feet wide if substantial bicycle volume and shared use with joggers and other pedestrians is anticipated. NPS policy directs trails be made accessible to the mobility impaired where possible. There is adequate opportunity to make this trail accessible according to the Americans with Disabilities Act (PL 101-336, 1990).

At Beach Center B, the pathway would follow the east edge of the parking lot (Figure 4). Between Beach Centers B and C, the pathway would follow the dune between the seawall and Hartshorne Drive (Figure 5) At Beach Center C the path would follow the east side of the parking lot. From Beach Center C, the pathway would be adjacent to the east side of Hartshorne Drive and west of the sheet piling constructed to prevent the erosion of the road (Figure 6). The path would then follow the east side of the Beach Center D parking lot. The path would proceed to the southwest corner of the Beach Center E parking lot by making a diagonal connection to the west of the Spermaceti Cove Visitor Center. From the visitor center there are two options as shown on Figure 2. The path could follow the west side of the Beach Center E parking lot to the northwest corner connecting to an old railroad grade through a thicket to Hartshorne Drive near the ranger station or cross the existing visitor center parking lot and proceed along Hartshorne Drive to the ranger station. The path would then follow Hartshorne Drive north to Atlantic Drive (Figure 7). At Atlantic Drive the pathway would go through parking lot L at the Nike site and follow the trail to the Halyburton Monument. The pathway would traverse the west side of the Halyburton Monument and continue along the east side of Hartshorne Drive. At Raccoon Alley there are two options as shown in Figure 2.The pathway could follow the eastern northbound lanes of Hartshorne Drive (Figure 8) or the western southbound lanes (Figure 9). Depending on this choice the width of the section of roadway chosen for the path would be reduced in width. The section chosen for vehicular traffic would be widened approximately 7 feet to accommodate two-way traffic (Figure 8 and 9). At the intersection of Hartshorne Drive and Magruder Road the pathway would cross the roadway and follow the west side of Hartshorne Drive north to the proposed ferry landing (Figure 10).

The pathway would also connect the proposed ferry terminal with the North Beach Center and Gunnison Beach. This segment would be constructed along the south side of South Bragg Drive. At Battery Potter the pathway would cross diagonally along the abandoned roadbed to the proof battery and on to North Beach along existing pedestrian paths. From North Beach the pathway continues along the existing sidewalk on the east side of the parking lot and then west to Atlantic Drive connecting to the Gunnison Beach Center along the east side of Atlantic Drive. From the ferry terminal, the trail would connect to Gunnison beach via South Bragg Drive at Knox Road and traveling south to the Mortor Battery. Knox Road would be closed to vehicle traffic. The pathway would go along the abandoned road west of the battery and connect diagonally to Gunnison Beach. Road markings and/or signs would be used to connect the lighthouse area with the main pathway via Hudson Road.

ENVIRONMENTAL ASSESSMENT
MULTI-USE PATHWAY
PREFERRED ALTERNATIVE



* RACCOON ALLEY & BAY SIDE - OPTIONS

OPTION 1 - PATHWAY ON BAY SIDE ROAD AND WIDEN RACCOON ALLEY TO TWO WAY TRAFFIC

OPTION 2 - PATHWAY ON RACCOON ALLEY AND WIDEN BAY SIDE ROAD TO TWO WAY TRAFFIC

** PATHWAY TO BEACH CENTERS D & E - OPTIONS

OPTION 1 - PATHWAY THROUGH EAST SIDE OF MUSEUM PARKING LOT ALONG WEST SIDE OF PARKING LOT E

OPTION 2 - PATHWAY THROUGH MUSEUM PARKING LOT TO EAST SIDE OF HARTSHORNE DRIVE

AUGUST 2002
FIGURE 2

Preferred Typical Section

The value analysis began with the assumption that an alignment on the east side of Hartshorne Drive has a preferred typical section that is separated from the roadway by a buffer. The recommended plans evolved to address the particular opportunities and constraints the site presented along the length of the trail.

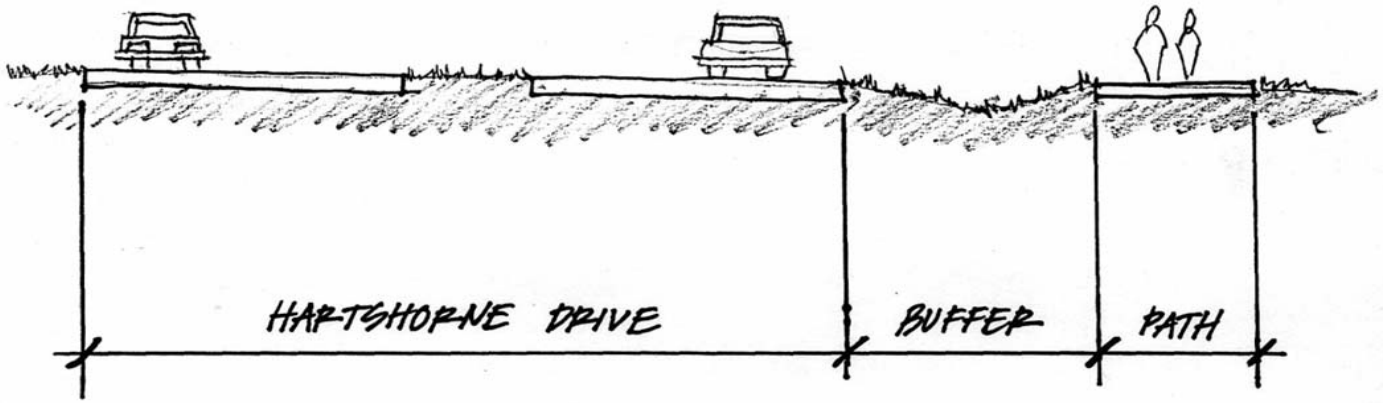


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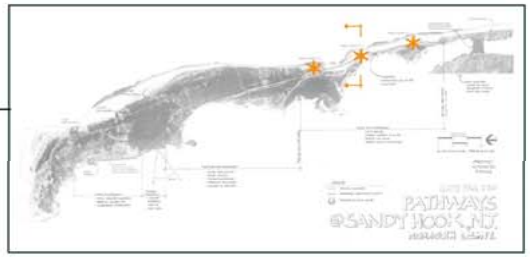
Figure 3

Beach Center



A trail alignment separated from the roadway can easily be connected to each of the beach centers and avoid crossing driveway connections from Hartshorne Drive.

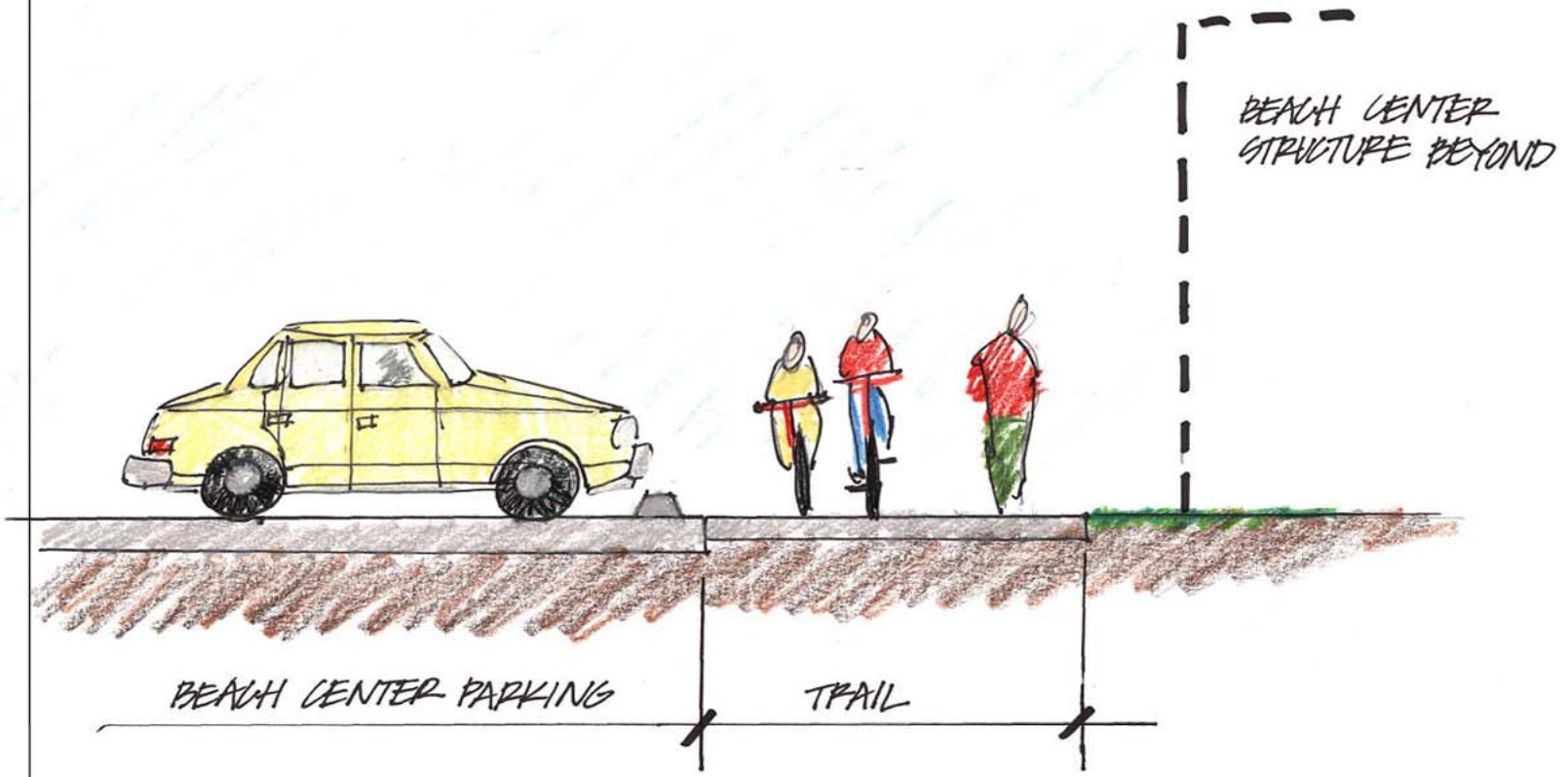
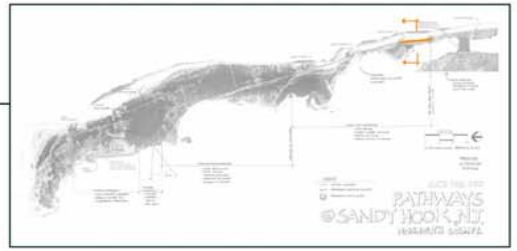


Figure 4

Typical Trail–Fee Station to Beach Center "B"



Heading north from the fee station, the trail can be separated from the roadway by a buffer. This is the safest alignment and the simplest, least expensive kind of construction.

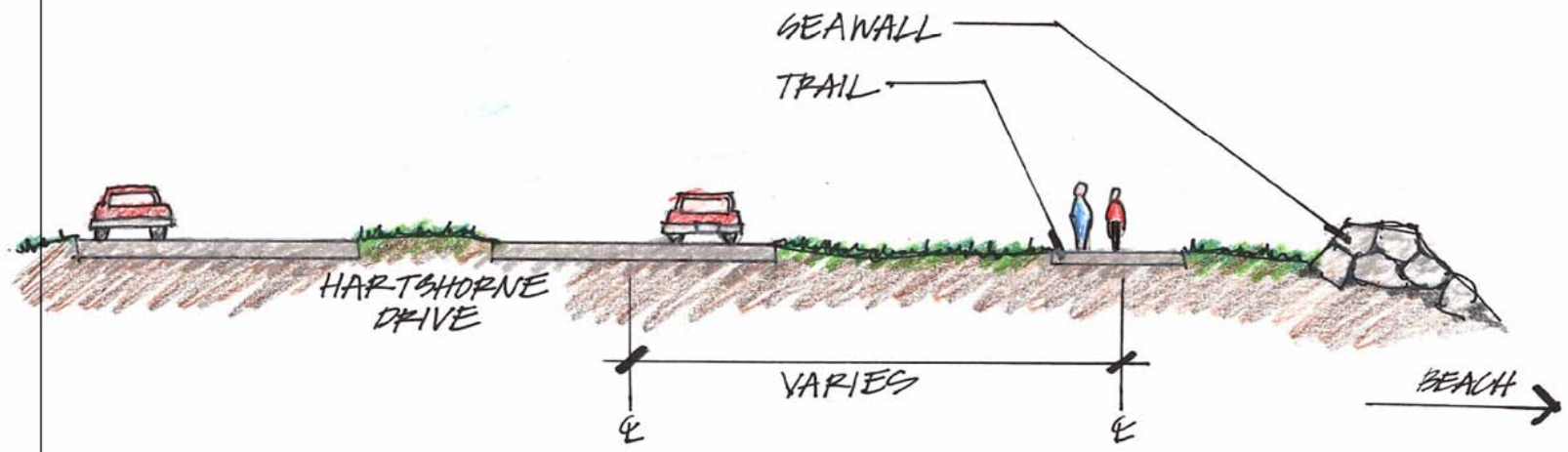


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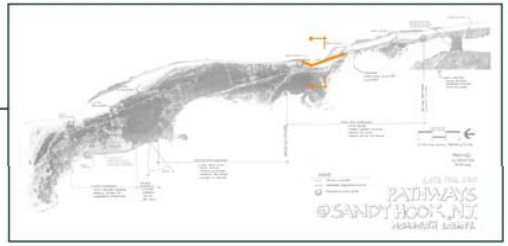
Figure 5

Trail at "Critical Zone"



The road through the critical zone has been realigned and a sheet pile retaining wall has been constructed, making it possible to provide a trail separated from the road by a buffer zone.

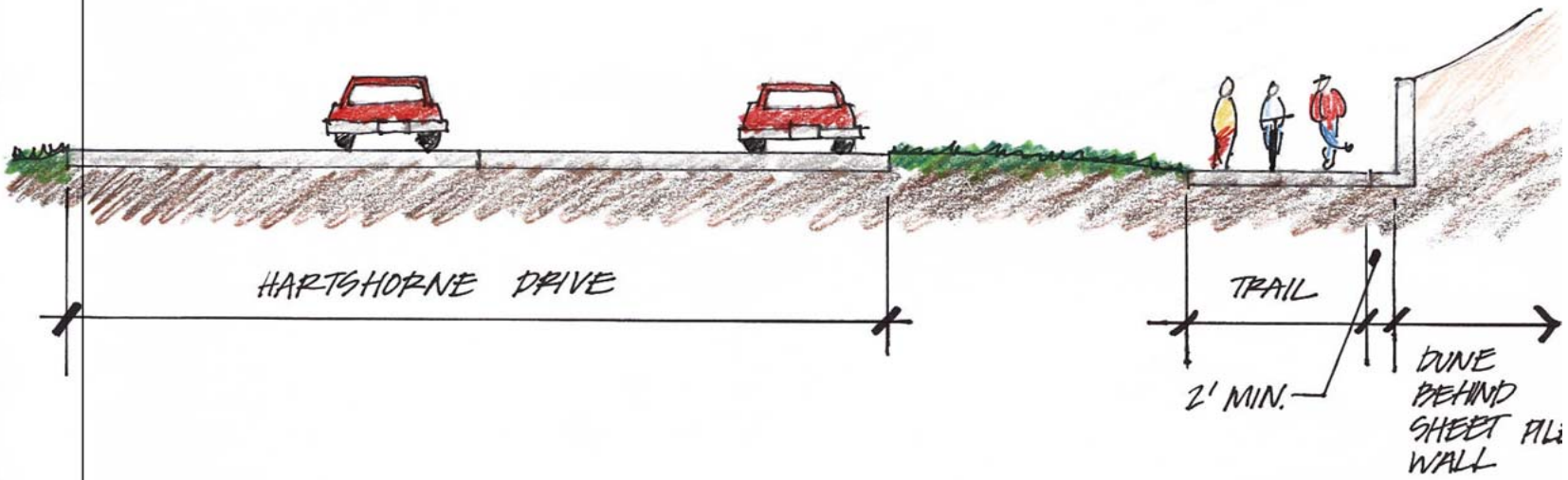


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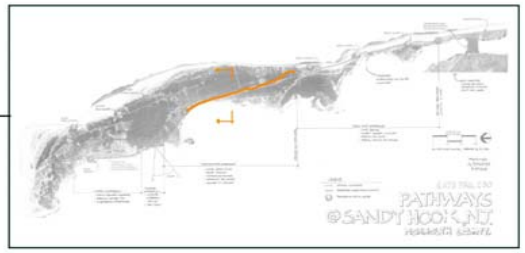
Figure 6

Typical Trail at Maritime Woods

From Beach Center E to Atlantic Drive, the preferred typical section can be constructed.



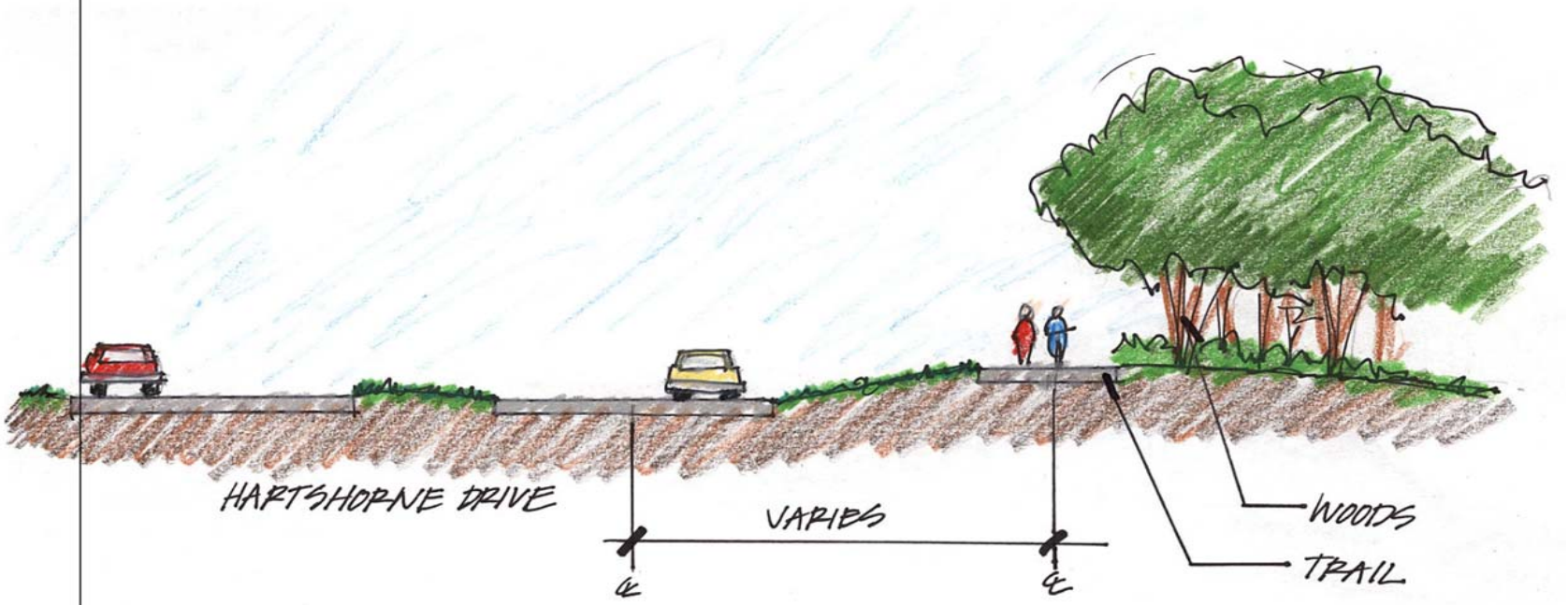


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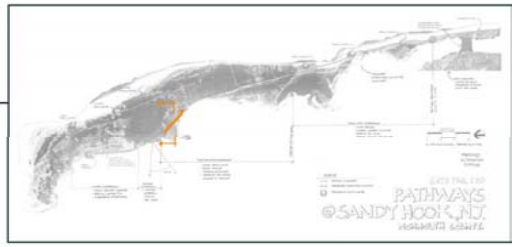
Figure 7

Typical Trail–Atlantic Drive to Raccoon Alley



Between Atlantic Drive and Raccoon Alley, a variation of the preferred typical section can be constructed.

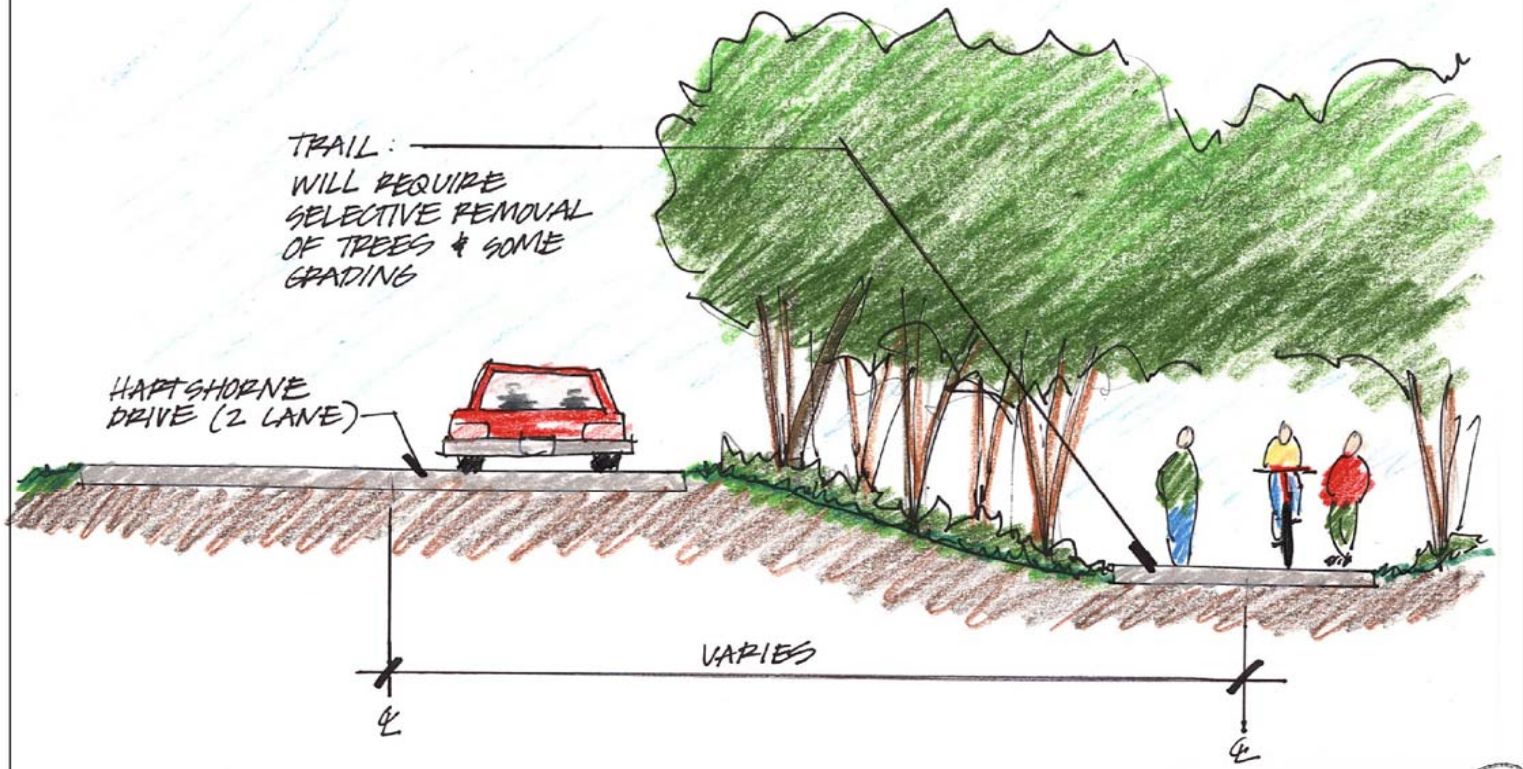


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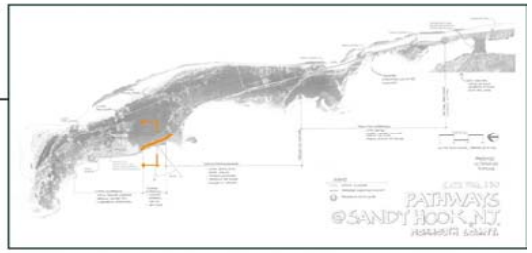
Figure 8

Typical Trail at Raccoon Alley



The trail will use the existing street section of Hartshorne Drive. Raccoon Alley, parallel to Hartshorne Drive, will be converted to two-way traffic.

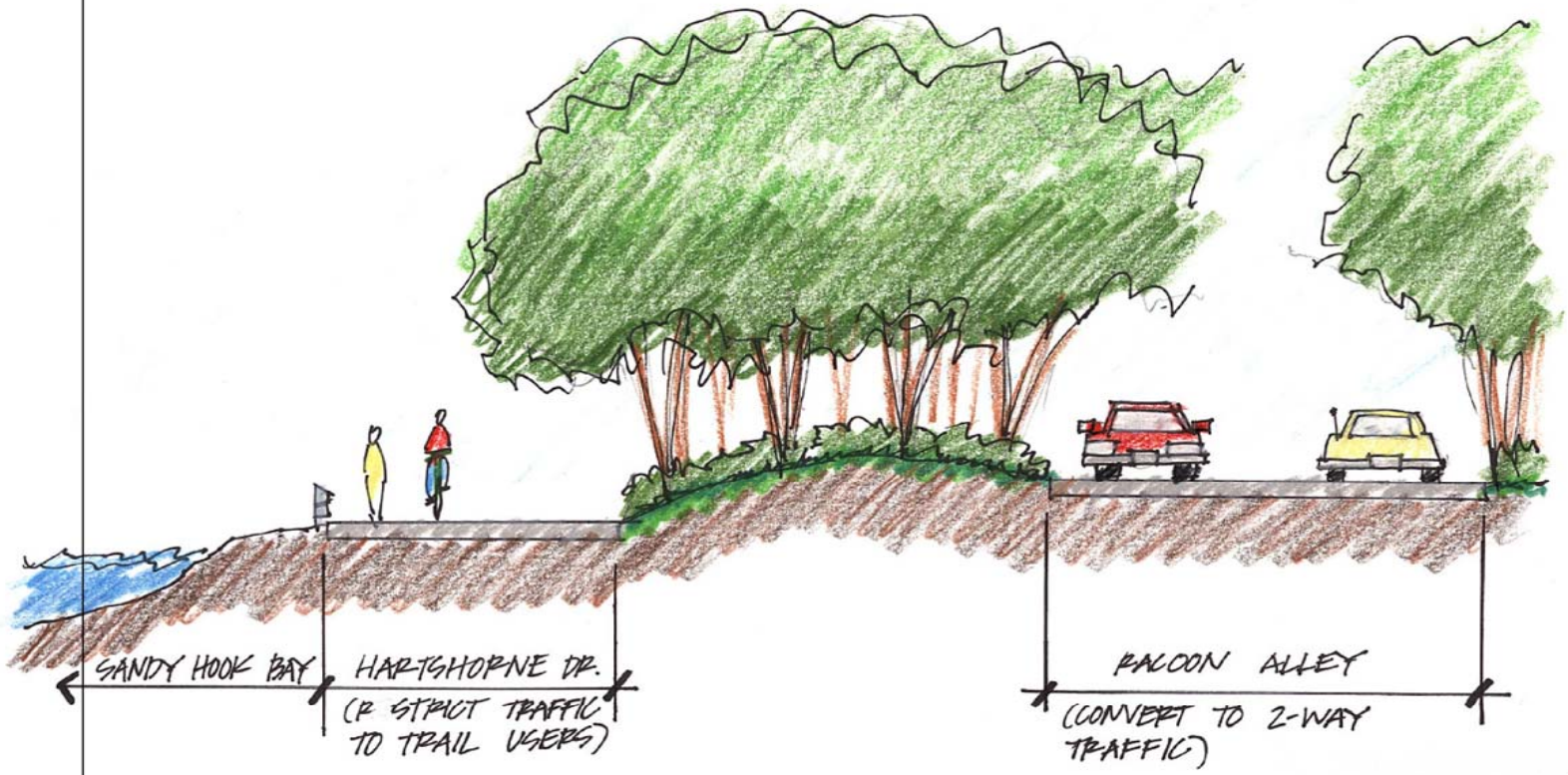


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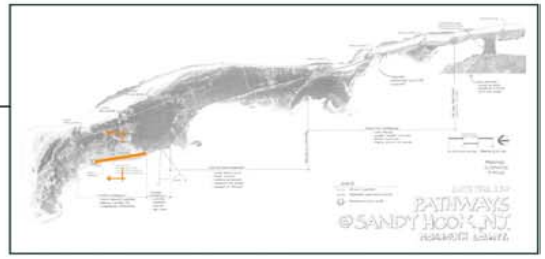
Figure 9

Typical Trail at Fort Hancock



The trail through at historic Fort Hancock is another variation on the preferred typical section. Trail construction through this area will require coordination with the proposed planting restoration.

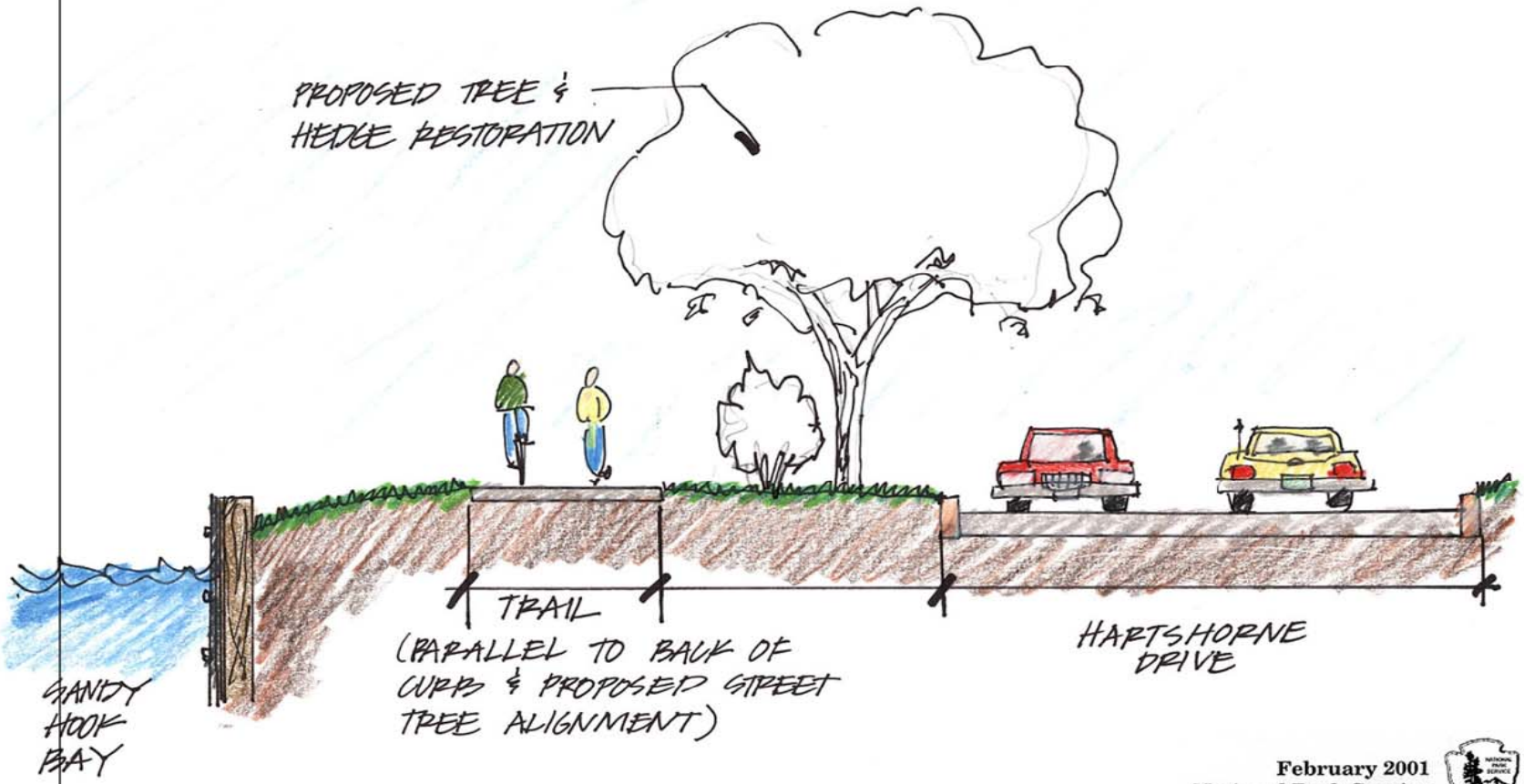


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Figure 10

MITIGATION

At the southern beaches, the pathway is close to recent or potential piping plover nesting and foraging areas, therefore the pathway would be constructed landward of the existing seawall. This would remove bicyclists and pedestrians from the birds' line of sight, and minimize disturbance. To further minimize disturbance to the plover, the following action would be taken:

- no construction would take place in these areas between April 1 and September 1
- no beach access or pathway amenities would be provided in front of nesting areas
- signs and fencing would be erected along the path to discourage visitors from crossing over the seawall to nesting areas
- monitoring and continued implementation of the park's Piping Plover Management Plan
- continue coordination and consultation with the Fish and Wildlife Service
- educating and informing visitors about the piping plover

These mitigating measures would also benefit the northeastern beach tiger beetle.

In areas near nesting areas for ospreys and least tern, construction activities would be prohibited during the breeding season (April 1 through September 1).

Mitigation for wild wormwood would consist of a combination of seed collection, transplanting existing plants out of the construction area, and designing the path to avoid impacting the plants.

Mitigation for lost plant communities consists of rehabilitation and restoration activities such as removal of debris, eradication of invasive exotic plants, aeration and supplementation of soils, and planting of compatible native plant material. These activities would occur at the following disturbed areas:

The area surrounding Batteries Kingman and Mills along Sandy Hook Bay: In the past, this area has been used as a scout camp and a construction staging area. The area is paved and contains rubble and debris from various sources (about 3 acres).

An old roadway just south of the access to Area E. (about 0.14 acres)

Several paved roads west of Battery Granger: (about 0.5 acres)

An old road segment north of the former radar site, extending from the traffic circle to Atlantic Drive.(about 0.3 acres)

These areas would be rehabilitated and restored to reflect the adjacent communities. The result would be about 0.4 acres of woodland and approximately 8.0 acres of mixed grassland.

If during construction unknown archeological resources were discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed and executed, if necessary, in consultation with the New Jersey State Historic Preservation Office.

Mitigation for cultural landscapes would include restoring a privet hedge at Officers Row, a missing landscape. The hedge was planted in 1899 and extended for almost 3,000 linear feet along Hartshorne Drive and a portion of Hudson Road. This hedge is currently not at the site.

The privet hedge would be replanted according to the historic alignment and screen the MUP from Officer's Row along the west-side of Hartshorne Drive. As close as possible, the path would be placed on the Bay side of hedge thereby screening the MUP from casual visitor view.

The original hedge has been identified as a privet hedge, a specific genus. However, it is not known whether that genus is tolerant of the growing conditions located at the Fort. Should it be determined that a privet hedge would not be likely to survive in that environment, a similar shrub more tolerant to the prevailing conditions, in compliance with *The Secretary of the Interior's Standard for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes,* would be used. The combination of the hedge and its placement relative to the MUP would be expected to screen the majority of the proposed MUP.

The multiuse pathway would promote sustainable design by adopting design guidelines and construction standards that are environmentally sensitive and have minimal impact on the land. Simplicity of design and construction reduces maintenance costs and increases operating efficiencies. Materials used in constructing the multiuse trail(s) would meet all local and national occupational safety and public health service guidelines for health and toxicity standards.

ALTERNATIVES CONSIDERED BUT ELIMINATED

The following alternatives were considered during project planning but were eliminated from further consideration for the reasons stated below.

Pathway on Atlantic Drive from Hartshorne Drive to Gunnison Beach

The 1979 *General Management Plan* (GMP) for Gateway NRA and subsequent 1990 *General Management Plan Amendment* identified eliminating motor vehicle traffic on Atlantic Drive and converting the road to a bicycle pathway. This proposal was evaluated in the 1993 *Environmental Assessment for the Development of Beach Centers at North Beach and Gunnison Beach*. Implementation of this option was based on anticipated traffic volumes associated with summer beach traffic and redevelopment at Fort Hancock. Elimination of Atlantic Drive would leave two lanes north of the Atlantic Drive and Hartshorne Road intersection. It was determined two lanes was insufficient to handle expected traffic and adding two new lanes through this area would cause too great an impact. Having Atlantic Drive as a second access route to the north end of the park is considered advantageous, and the use of Atlantic Drive as a multiuse pathway has been eliminated.

Placing the pathway alongside Atlantic Drive was also considered. It was rejected because the trail would be less direct and would not connect to features of interest such as the Nike Radar Site, Halyburton Monument, Horseshoe Cove, and Guardian Park. In addition, this alternative would be more costly.

Pathway on West Side of Hartshorne Drive

The National Park Service considered constructing a pathway along the west side of Hartshorne Drive to eliminate potential conflicts between pathway users and automobiles at entrances to beach centers east of Hartshorne Drive. A pathway on the west side of Hartshorne Drive would increase safety concerns because visitors would be forced to cross both the southbound and northbound traffic lanes. A concrete seawall is adjacent to the west shoulder of Hartshorne Drive near Beach Center B and there are extensive wetlands adjacent to the west side of Hartshorne Drive from south of Beach Center D north to the ranger station. Technical difficulties and engineering costs with constructing a cantilevered pathway near Beach Center B (Figure 11) and impacts to wetlands also contributed to the elimination of this alternative.

Pathway Atop Seawall East of Hartshorne Drive

The NPS considered constructing a pathway along the top of a seawall east of Hartshorne Drive. However, the seawall is in poor condition and is located adjacent to several areas that support nesting Piping Plovers and other species of concern. Therefore, based on the anticipated high costs necessary to rehabilitate the seawall to support a multiuse pathway (Figure 12) and the adverse effects the pathway would have on nesting Piping plovers as determined through informal consultation with the U.S. Fish and Wildlife Service, this alternative was eliminated from further consideration.

Shared Roadway on Hartshorne Drive

Early in the planning process, an alternative that would have called for shared use of Hartshorne Drive was considered (Figure 13). A value analysis process determined this alternative would not meet the purposes of the project because it would not resolve the safety issue satisfactorily. The visitor traffic is very high on weekends and all lanes are needed to accommodate this volume. The shared roadway concept would not reduce safety concerns adequately. Turning vehicles across the flow of bicycle and other users on the pathway would present undue risk to visitors on the pathway and using the road system. Widened shoulders, or pathways adjacent to, but separate from the park road with barriers were not considered for the same reason.

Cantilevered Boardwalk

The alignment described in the PMIS on the west side of Hartshorne Drive would require more than 1000 linear feet to be constructed as cantilevered boardwalk, which is akin to bridge construction. This scenario was eliminated early in the value analysis process for both construction and life cycle costs.

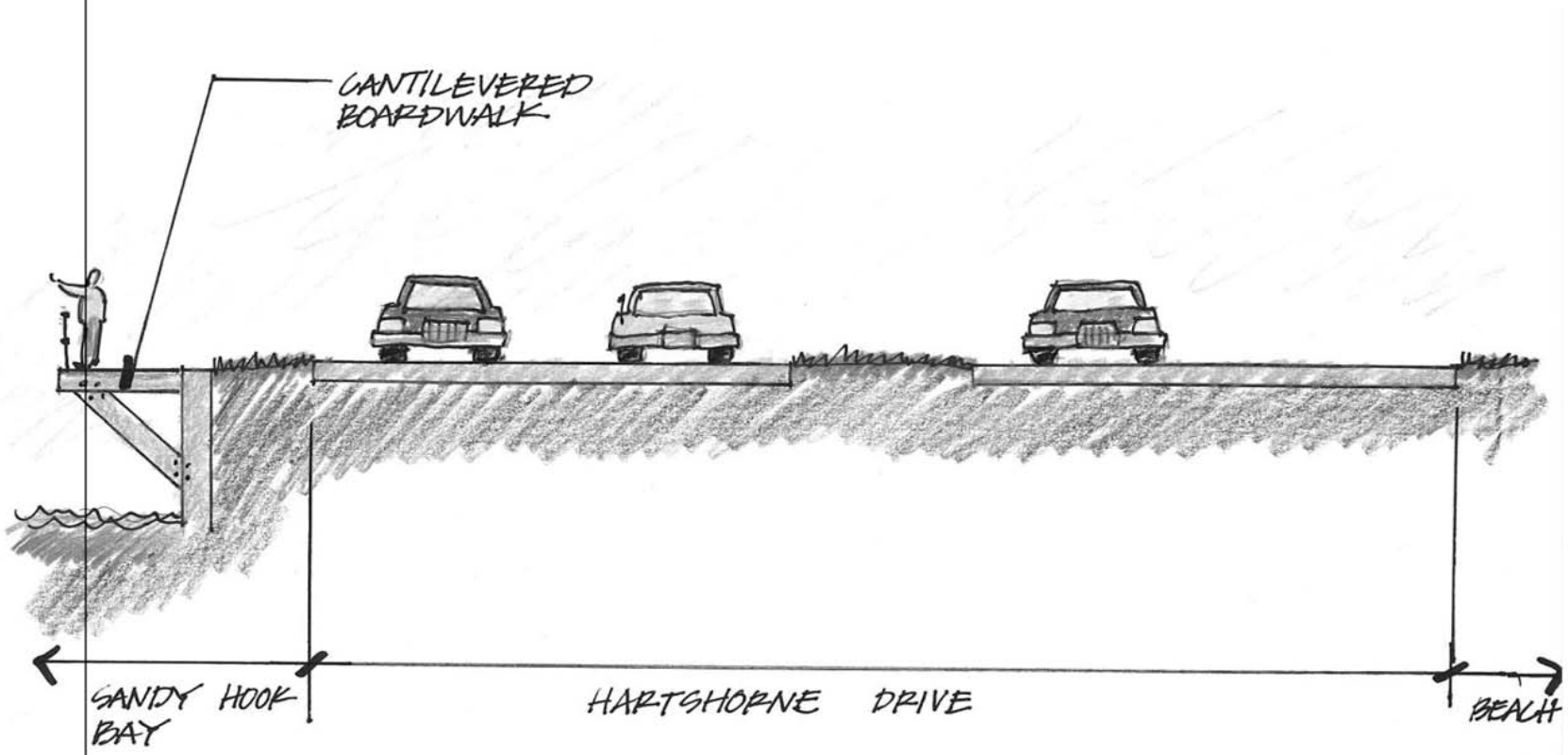

Figure 11

Boardwalk on Rubble/Concrete Seawall

Alternative path alignments at the beach centers along the top of the seawall would have provided direct access to the beach, but safety concerns, construction and life cycle costs were prohibitive.

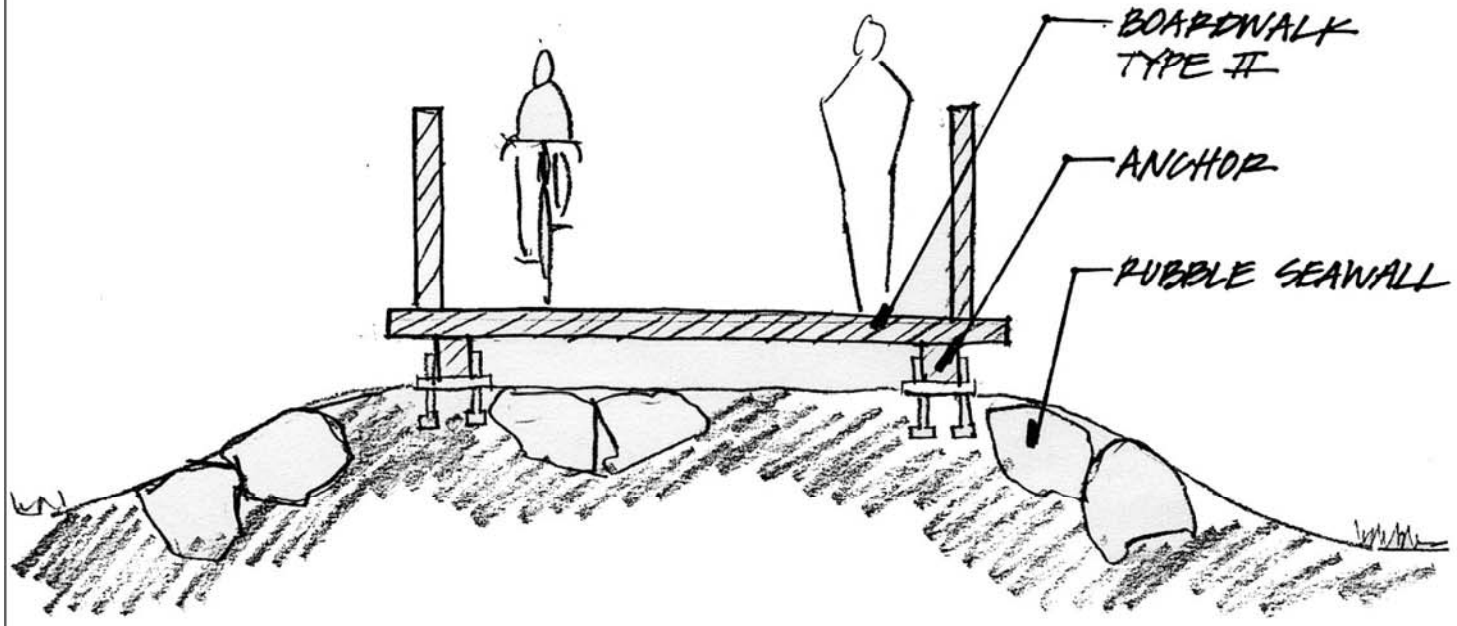

Figure 12

An "On Street" Scenario

An on-street alternative was considered, but the trail would present safety concerns because bicyclists would travel against traffic and construction costs would increase as the trail was connected to the existing roadway.

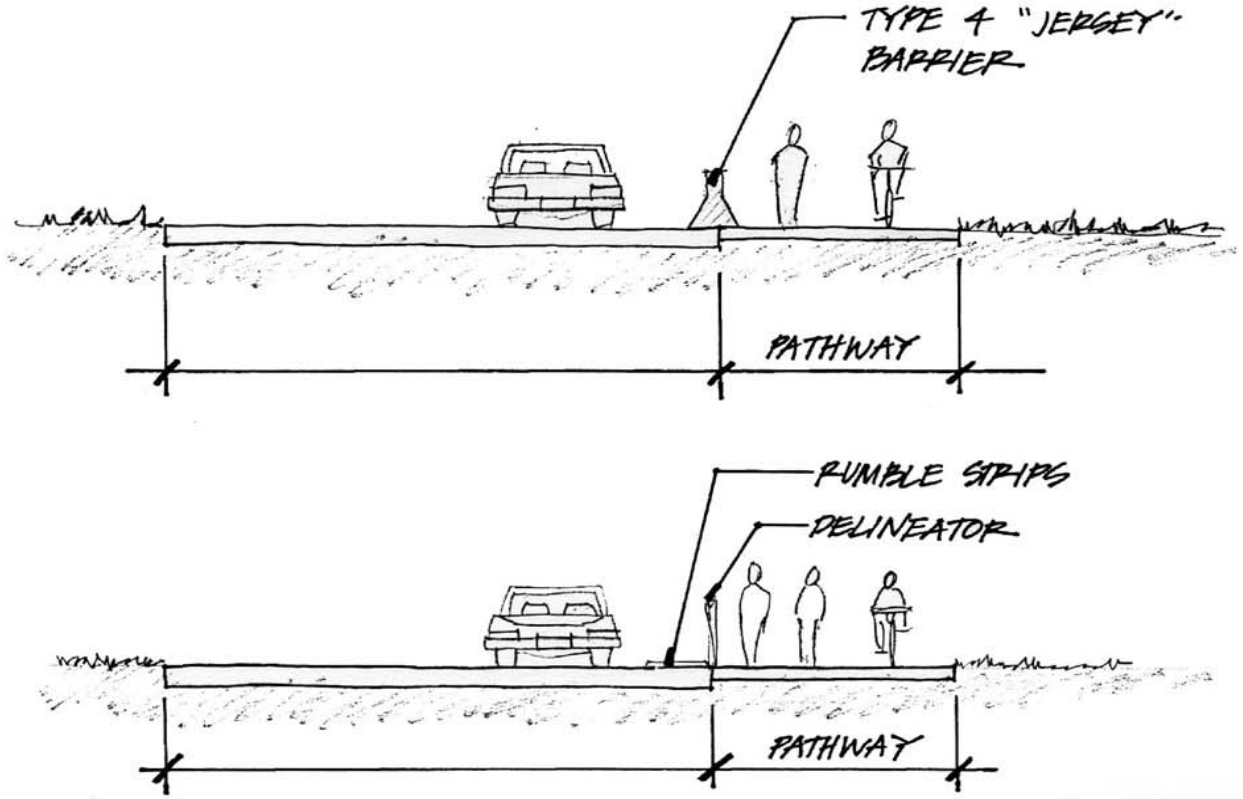

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Figure 13

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The National Environmental Policy Act (NEPA) requires the National Park Service to identify the "environmentally preferred alternative" in the planning process. The environmentally preferred alternative is determined by applying the criteria listed in the National Environmental Policy Act of 1969 (Sec. 101 (b)), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of NEPA, which includes alternatives that

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations
- assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings
- attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences
- preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice
- achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities
- enhance the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (PL 91-190)

The no-action alternative would fulfill the responsibilities of each generation as trustee of the environment for succeeding generations by continuing to preserve Sandy Hook; however, this alternative would not assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings because conflicting use would continue unsafe conditions within the park. The no-action alternative would not attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences because the health and safety risk associated with incompatible use of facilities would remain. The no-action alternative would preserve important historic, cultural, and natural aspects of our national heritage but limit diversity and variety of individual choice because no choice would be provided to visitors regarding the method to access these resources. The no-action alternative would not balance population and resource use that permits high standards of living and a wide sharing of life's amenities because those without automobiles would have no safe means of taking advantage of the resources. The no-action alternative would provide limited opportunity to enhance the quality of renewable resources and the maximum attainable recycling of depletable resources because no renewable resources would be used.

Construction of the multiuse pathway would not conflict with the NPS responsibilities as trustee of the environment for succeeding generations. Construction of the pathway would be a measure to assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings by eliminating safety issues associated with incompatible use of the roadway and allowing visitors to enjoy the environment at Sandy Hook by using alternative transportation for access. Construction of the pathway would attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences. Even though the pathway would require the

use of some resources, the effects would be mitigated in areas that provide greater benefit than the area affected. Safety risks would be reduced. Construction of the pathway would preserve important historic, cultural and natural aspects of our national heritage and would promote an environment that supports diversity and variety of individual choice. Visitors would be provided choice in the mode of access that would be compatible with economic diversity and environmental and aesthetic values. Construction of the pathway would achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities. The pathway would provide access to park resources to visitors, regardless of economic status, physical ability, or values. Construction of the pathway would have little opportunity to enhance the quality of renewable resources, but would provide opportunities to use recycled materials to construct the project, as well as promote conservation by using less fossil fuel to experience the park.

As considered in this EA, the preferred alternative is the "environmentally preferred alternative." After review of potential resource and visitor impacts, and developing mitigation for impacts to natural and cultural resources, this alternative would provide for the greatest protection of natural and cultural resources in the park while also enhancing visitor experience and opportunities in the park.

TABLE 1: FEATURES OF THE ALTERNATIVES

No Action	Preferred Alternative (see Figure 2)
No Pathway	Paved Pathway-12 feet wide with 2-foot shoulders on either side.
	East of Hartshorne Drive(grade separated from roadway)
	East of Beach Parking Lot B to eliminate traffic crossing path.
	East of Beach Center C parking to eliminate traffic crossings.
	East of Beach Center D parking lot to eliminate traffic crossings.
	West of Beach Center E parking lot because of narrow beach on east.
	East of Hartshorne Drive between Ranger Station and South end of Fort Hancock.
	Follows east or northbound lane of Hartshorne Drive at Randolph Drive Pavement narrowed to achieve desired width with shoulders. Option to follow west or southbound lane.
	West of Hartshorne Drive from Guardian Park to Ferry Terminus. Separation varies because width of area between Hartshorne Drive and seawall varies.

TABLE 2: HOW THE ALTERNATIVES MEET PROJECT OBJECTIVES

No-Action Alternative	Preferred Alternative
Objective 1: Improve safety measured by reduction in conflict and accidents between bicyclists, pedestrians, and automobiles.	
Safety issues would not be addressed.	Separation of incompatible uses would measurably reduce conflict and accidents.
Objective 2: Minimize impacts to natural resources and cultural resource elements that contribute to the National Register property	
No natural or cultural resources would be affected.	About 6 acres of land would be developed. The alignment would follow existing development to minimize disturbance. Cultural resources would be avoided where possible and appropriately mitigated where not. A determination of effect under §106 found that Halyburton Memorial Landscape would not be adversely affected.
Objective 3: Create a new high quality recreational amenity that provides visitors with a healthy, enjoyable outdoor experience.	
No new amenity provided	A new recreational amenity provided.
Objective 4: Provide nonmotorized public access to the natural and cultural resources of the park.	
Few nonmotorized access opportunities currently available.	Additional nonmotorized access opportunity provided.

TABLE 3: SUMMARY OF IMPACTS

Impact Topic	No-Action Alternative	Preferred Alternative
Wetlands	None affected	None affected
Sand Dunes	None affected	0.5 acre relocated. Minor short-term impact
Plant Communities	None	Total of 6.06 acres converted to pavement. Approximately 6 acres of previously disturbed land revegetated. Minor long-term impact in relation to total community area.
Piping Plover	No effect if cumulative actions occur outside the nesting season	No effect-construction occurs outside the nesting season
Osprey	No effect if cumulative actions occur outside the nesting season	No effect-construction occurs outside the nesting season
Least Tern	No effect if cumulative actions occur outside the nesting season	No effect-construction occurs outside the nesting season
Wild wormwood	No effect on existing populations	Population reduced by conversion of habitat. Shoulders provide new habitat allowing population increase. A negligible effect.
Archeological Features	No adverse effect	No adverse effect
Historic Buildings and Structures	No adverse effect	No adverse effect
Cultural Landscapes	No adverse effect	No adverse effect
Visitor Experience	The visitor experience degrades because safety issues interfere with enjoyment.	The visitor experience improves because the pathway eliminates the safety concerns for most bicyclists and additional opportunities to experience the park are provided. A moderate long-term effect.
Visitor Safety	Visitor safety and well-being declines because of shared use of the roadway.	Conflicts caused by shared use of the roadway are reduce or eliminated for most bicyclists. A moderate long-term effect.

AFFECTED ENVIRONMENT

NATURAL RESOURCES

Sand Dunes

Sand dunes provide a transition from coastal beaches to upland areas in the park and include primary dunes, foredunes, and backdunes.

Primary dunes are the dunes closest to the ocean and are formed as wind-blown sand accumulates at the base of vegetation and beach debris. Dominant vegetation on primary dunes includes American beach grass, seaside goldenrod, sea rocket, and wormwood. In addition, the backside of primary dunes may support low-growing shrubs, such as poison ivy and fragrant bayberry. Foredunes comprise the oceanside face of primary dunes. Foredunes are particularly dynamic regions of sand dune habitat and change frequently in accordance with weather, wind, and human activity. Although vegetation on foredunes is generally sparse, these areas, as well as the backsides of primary dunes, sometimes are used heavily by nesting shorebirds. Backdunes, or secondary dunes, are the dunes farthest from the ocean and are located behind the primary dunes. Dominant vegetation on backdunes includes beach grass, goldenrod, sea rocket, poison ivy, and bayberry. Backdunes provide habitat for a variety of wildlife, including eastern cottontail (*Sylvilagus floridanus*) and the eastern kingbird (*Tyrannus tyrannus*).

Approximately 0.5 mile of backdunes border the east side of Hartshorne Drive between Beach Center B and Beach Center C; dunes in this area are located immediately adjacent to the road and rise approximately 15-20 feet above the road elevation. American beach grass is the dominant plant in dune areas, although other plants also are present (as listed in the preceding paragraph). Other dunes near the project area, including approximately 0.4 mile of constructed backdunes along the east side of Hartshorne Drive between Beach Center C and Beach Center D, would not be affected by the alternatives considered in this EA.

Plant Communities

Ten upland plant communities were defined by the National Park Service Cooperative Research Unit and the Botany Department of the University of Massachusetts in 1975 (NPS 1975). Drive Richard Stalter, of St. John's University, grouped the plants at Sandy Hook into n19 communities in his study (Stalter, 1980) Recent communication with Drive Stalter indicates that this classification still is applicable to resource evaluation at Sandy Hook (Stalter, personal communication, 2001). For the purpose of this analysis, the community types follow the general groups identified in the GMP (NPS 1979). The project area includes the following community types: Grassland, including beachgrass dune, mixed grassland, and heath; shrubland, including open shrub land and low thicket; and woodland, consisting of high thicket and deciduous forest.

The community delineation in the 1975 study is similar to Stalter's study. The quantification has changed little. The collective area of the upland community types is presented below.

Community	Area (Acres)
Grassland	363
Shrub Land	206
Woodlands	390

The heathland community (*Hudsonia tomentosa*) is fragile, locally unique, and relatively small in relation to the total area of Sandy Hook. There are 53 acres of heath, found in patches behind the primary dune on the Atlantic side of the hook. There is very little heath community in the project area. The Bayside Holly Forest, rare and locally unique along the northeastern Atlantic coast, is resilient to human use. This community is outside the project area. The dunegrass community is essential for maintaining a stable dune system. All the communities are important components of the natural barrier system, and contribute to both ecological processes and the scenic quality.

Species of Concern

According to the U.S. Fish and Wildlife Service (USFWS, 2000) and the New Jersey Department of Environmental Protection (NJDEP, 2000), several species protected under the federal Endangered Species Act or by the State of New Jersey have been documented or may occur at the park. Although no species of concern have been documented in areas that would be affected directly by alternatives considered in this EA, several species, including Piping Plover (*Charadrius melodus*) osprey (*Pandion haliaetus*), and least tern (*Sterna antillarum*) are found and nest within close proximity of the proposed pathway alignment. In addition, wild wormwood (*Artemisia campestris caudata*) a plant designated by the state of New Jersey as a Species of Special Concern does occur within the proposed alignment. No critical habitat for threaten or endangered species has been designated at the park. Table 4 provides a list of species identified and a determination regarding occurrence in the park.

TABLE 4: SPECIES OF CONCERN

Common Name (*Scientific Name*)	Status	Present in Park	Potential Presence in Project Area
Animals:			
Piping Plover (*Charadrius melodus*)	FT SE	Yes	Moderate – has been documented nesting and rearing young in coastal and bayside areas of the park, including areas east and west of Hartshorne Drive in the southern portion of the project area (i.e., Fee and Hidden Beaches), at the "Critical Zone", and near Gunnison and North Beaches (Figure 4). Piping Plovers begin arriving at park as early as mid-March. Adults and fledged offspring begin leaving New Jersey in late August with most birds having left by September.
Northeastern Beach tiger beetle (*Cincindela dorsalis dorsalis*)	FT	Yes	None – was reintroduced in 1990s in northern area of park, including North Beach, where the species inhabits intertidal zone of ocean-side beaches. No such habitat is present in the project area and no additional visitors would be directed toward areas of potential concern under the alternatives evaluated in this EA.
Bald eagle (*Haliaeetus leucocephalus*)	FT SE	overflights	None – although transient eagles have been documented overflying the park, no eagles have been observed foraging, roosting, or nesting at park.
Roseate tern (*Sterna dougallii*)	FE,	Foraging only	None – although transient roseate terns have been observed foraging in park waters, no roseate terns have observed nesting or roosting at the park.
Least tern (*Sterna antillarum*)	SE	Yes	Moderate – has been documented nesting and rearing young in coastal and bayside areas of the park, including areas east and west of Hartshorne Drive in the southern portion of the project area (i.e., Fee and Hidden Beaches). Terns typically arrive in late April. They nest on sandy beaches or offshore islands. Adults and fledged offspring begin leaving migrate in late August with most birds having left by September.
Osprey (*Pandion haliaetus*)	ST	Yes	Moderate – nests on platforms west of Hartshorne Drive at Spermaceti Cove. Ospreys typically begin arriving at the park in mid-March. Adults and fledged offspring begin leaving New Jersey in late August with most birds having left by early September.
Black-crowned night heron (*Nycticorax nycticorax*)	ST	Yes	Low – has been documented at many locations in the park, including Nike pond south of the maintenance yard and other wetland areas, but not in project area. Feed at night, roost during the day.
Plants:			
Seabeach amaranth (*Amaranthus pumilus*)	FE SE	Yes	None – inhabits lower foredunes and ocean-side beaches. Although seabeach amaranth has been documented in the park with the highest concentration on southern beaches, appropriate habitat is not present in project area.
Coast flatsedge (*Cyperus polystachyos texensis*)	SE	No	None – typically inhabits brackish wetlands and/or dune swales (D. Snyder); although such habitat is present at park, none would be affected by the alternatives evaluated in this EA. In addition, no *Cyperus* plants were observed during 100-percent visual coverage survey of freshwater detention basins completed by NPS personnel (C. Davis, DSC-PDS) in fall 2000.
Wild wormwood (*Artemisia campestris caudata*)	SSOC	Yes	High – although widely distributed throughout the United States and common at the park, wild wormwood is uncommon in New Jersey. At the park, wild wormwood is most common in disturbed areas, particularly along roadsides including Hartshorne Drive.

Species of concern and critical habitat of potential concern in project area (FE = federally endangered; FT = federally threatened; SE = state endangered; ST = state threatened; and SSOC = state species of concern).

CULTURAL RESOURCES

The *Fort Hancock and Sandy Hook Proving Ground Historic District* was designated a national historic landmark (NHL) in 1982 in recognition of its exceptional national significance. With the exception of Plumb Island, Skeleton Hill Island, and South Island, the boundaries of the NHL district encompass the entire peninsula of Sandy Hook. The District was listed in 2000 in the *Secretary of the Interior's List of Most Threatened National Historic Landmarks* (60 landmarks are on the list).

National Register Properties

As described in the National Register of Historic Places Inventory Nomination Form, the Fort Hancock and Sandy Hook Proving Ground Historic District (District) is bounded by the Route 36 bridge to the south, the Atlantic Ocean to the east, Sandy Hook Bay to the west and Lower New York Harbor to the north.

In addition to the District, there are three other properties in the park listed on the National Register: The Sandy Hook Lighthouse (landmark status), the Spermaceti Cove Life-saving Service Station, and the Cove House Archeological Site.

There are 228 items listed on the NPS List of Classified Structures, and numerous other landscape elements, which contribute to the National Register properties. Two cultural landscape assessments, dating from 1995 and 1999, indicate that overall the District retains a high level of historical integrity.

Current Data. To date, there have been only two cultural resources surveys conducted other than those undertaken directly in compliance with the requirements of Section 106 of the NHPA. These two surveys, occurring in 1995 and 1999, were conducted to assess the nature and condition of areas considered cultural landscapes. The NPS Submerged Cultural Resources Unit conducted a magnetometer survey of areas offshore of Sandy Hook in September 1997. No comprehensive or systematic efforts to conduct representative terrestrial archeological surveys have been undertaken.

Archeology

Investigations conducted for other undertakings, in conjunction with unexpected finds associated with maintenance activity have established that the archeological record of Sandy Hook is highly varied in terms of its cultural associations, locations, nearness to ground surface, degree of preservation, and significance. Development of Sandy Hook for military, recreational and other purposes has resulted in some disturbance of subsurface archeological remains. With the possible exception of a few undisturbed inland locations where the landmass is comparatively stable, the dynamics of Sandy Hook's coastal environment make it unclear whether intact archeological deposits reflecting Native American use exist.

Although the archeological evidence is scant, four small but undefined prehistoric sites have been identified on Sandy Hook. These sites have not been evaluated and it is impossible to determine the period of their association. However, none are close to the proposed project corridor.

Archeological sites on Sandy Hook are associated with a variety of domestic, commercial, and military activities from the late-Colonial era through the mid-20th century. Most of the known sites are not within the project corridor. Previously unknown aspects of those and other historic and prehistoric sites may lie within the impact zone. Those sites that appear to be within or very near it may already be disturbed or may be buried deeply enough that construction would not disturb them.

Sandy Hook's long history as an Army weapons testing site and as a coastal defense site has left a legacy that includes threats to public safety from unexploded ordnance (UXO). The Department of Defense has conducted surveys to detect and remove UXO from public areas. Additional UXO remain on Sandy Hook; however, most of the project corridor lies outside the testing zone. Many are not only a threat to public safety, but are also archeological artifacts that reflect experiments and common practices of the Sandy Hook Proving Ground and of the defensive works erected on Sandy Hook.

The existence, integrity, and eligibility for inclusion in the NRHP for archeological resources along the corridor are unknown. A survey and limited testing program to identify archeological materials within the area defined is planned but has not yet been performed. The archeological fieldwork will be conducted in order to determine if any historic properties are present and to provide sufficient information to comply with the requirements of Section 106 of the NHPA and the Advisory Council on Historic Preservation's regulations 36 CFR 800.

Description of Survey and Limited Testing. Based on previous archeological investigations, and the geomorphological and earthmoving factors already identified, the area of the corridor may be classified into three levels of probability for encountering archeological resources. Sections of the corridor with high probability would require subsurface archeological testing prior to construction, and may requiring monitoring during construction. Moderate probability areas would require full-time monitoring by an archeologist during construction activities involving earth moving. Low probability sections would not require on-site monitoring. However, should construction activity lead to the discovery of cultural manifestations such as artifacts or features, the Park's cultural resources representative, park archeologist, or the Contracting Officers Representative would be notified and action consistent with 36 CFR 800.12 would be taken.

Discovery of artifacts and other subsurface materials, or intact soil strata revealed during shovel testing, indicating the presence of possibly significant archeological deposits, would necessitate additional shovel tests or larger formal test units. However, only limited excavation would be undertaken to provide detailed information regarding an identified feature or concentration of artifacts. All excavations at a location would cease as soon as it can be determined if the site possesses the elements necessary for its consideration as being eligible for inclusion in the NRHP.

Historic Buildings and Structures

In addition to those structures directly associated with the Fort Hancock and Sandy Hook Proving Ground Historic District, two other historic structures are listed individually on the

National Register of Historic Places — the Sandy Hook Lighthouse and the Spermaceti Cove Lifesaving Station.

The Sandy Hook Lighthouse property consists of the lighthouse structure and the associated lighthouse keepers quarters and barn. This two-story frame keeper's quarters located immediately adjacent to the lighthouse, was constructed in 1883 as a dwelling for the lighthouse keeper. The U.S. Coast Guard extensively renovated the interior of the structure in 1980. The quarters are currently used as a contact station for visitors.

The first structure built for the Spermaceti Cove lifesaving station was constructed in 1849. The 1849 structure was moved to the Twin Lights State Historical Park in nearby Highlands New Jersey. The present 1894 structure is a shingle-style building with a distinctive four-story tower and is currently used as a NPS visitor center and museum. The structure was restored in 1929-1930. The viewshed surrounding it has been dramatically altered as a result of the development of the associated parking lot. The integrity of the interior of the structure is low because of the degree of modification.

Cultural Landscapes

Currently the Sandy Hook Unit of Gateway NRA has no cultural landscapes formally designated by the NPS or listed on the National Register of Historic Places (NRHP). However, two areas of concern may be effected by the construction of the multiuse pathway: 1) Fort Hancock [including the Sandy Hook Lighthouse] and 2) the Halyburton Memorial.

Fort Hancock. This landscape is the result of a formally prepared master plan prepared by a Captain Arthur Murray of the Army's Quartermaster Department. This plan was implemented in 1895 and primary construction of the buildings completed in 1899. An historic landscape survey completed in 1999 indicates that the Fort Hancock Historic Landscape retains a high level of historical integrity (*Historic Landscape Assessment for Fort Hancock;* 1999).

Roads and walkways in the Fort Hancock and Proving Ground zones of the district have changed little since the end of WWII, and are important contributing elements to the District. Character-defining features include alignment, width, bluestone curbs, manhole covers, drain covers, and bluestone and brick paving materials. Evidence exists to indicate that the surface of the original landscaping, carried out during the final months of construction of the Fort, included brick and concrete walkways.

Although a number of historic buildings have been lost since the establishment of the park, the level of historical integrity in the Fort Hancock landscape is considered high, resulting in numerous historic views and vistas. Historic views of and from the Parade Ground, the Athletic Field, and the Bay Frontage remain. Historic vistas also remain along Hartshorne Drive, Kessler Drive, Kearny Road, Canfield Road, and Knox Drive.

Halyburton Monument. The Halyburton Monument is a Civilian Conservation Corps (CCC) construction and landscape consisting of a triangular shaped clearing with a retaining wall defining the western edge against Hartshorne Drive. The cleared area is grassy, with a central flagstone path leading from the wall to the apex of the triangle, leading to a square flagstone column. Inset into the column rests a cast metal marker memorializing the fate of the British seamen that died in a shipwreck at Sandy Hook. A monument was constructed in the early

19th century, but the location is not known. The monument is located within the District and is identified as a contributing element in the National Register Nomination for the Fort Hancock and Sandy Hook Proving Ground Historic District. No eligibility recommendation has been made.

VISITOR EXPEREINCE

Between 2.2 and 2.5 million people a year visit Sandy Hook; approximately 500,000 of those tour Fort Hancock. Primary use is beach recreation and fishing. Visitors park at designated areas and walk to beach areas. Perhaps 80% of the visitors to Fort Hancock experience the fort on their own, either by driving or strolling around the grounds. Unlike the rest of Sandy Hook, which is busiest during the summer beach season, visitation in the Fort Hancock area is more evenly divided throughout the spring, summer, and fall. The National Park Service operates a number of sites open for touring on weekends through much of the year, including the Fort Hancock Museum (also open daily in summer), the Sandy Hook Lighthouse, History House, and Battery Potter. Over 50,000 visitors per year tour these National Park Service staffed sites. There are approximately 5,000 parking spaces in the park.

VISITOR SAFETY

The primary park road is Hartshorne Drive, which extends from the park entrance to Fort Hancock, about 5 miles. The average annual traffic (1999-2001) is about 975, 000 vehicles entering the park (NPS 2002). All visitors must use Hartshorne Drive to reach their destination. About 40,000 bicyclists use Sandy Hook annually. Three groups of cyclists are recognized as using the park, based on level of experience and skill. Group A (Advanced Bicyclists) consists of experienced riders who can operate under most traffic conditions. Group A cyclists use the park at any time, but gravitate toward off peak times. Group B (Basic Bicyclist) are casual cyclists or new adult and teenage riders who are less confident of their ability to operate in traffic without special provision for bicycles (bike lanes or separate facilities). Group C (Children) contains pre-teen riders whose roadway use is often initially monitored by parents (NYSDOT, 1995). Use by Groups B and C is expected to increase in the future, particularly with the development of bikeways connecting to Sandy Hook to other areas outside the park. The highest use occurs on weekends during the summer (June, July, and August), but cyclists use the park throughout the year. Most bicyclists currently using Sandy Hook would be categorized as Group A. Bicyclists use the road system because no other options are available. Although Hartshorne Drive is four lane most of its length, the roadways are not wide enough to accommodate shared use during high use visitation. The road shoulders are sandy and do not support narrow wheels, causing many bike mishaps along the road.

Posted traffic speeds on Hartshorne Drive vary. Between the entrance and the Ranger Station, the speed is 35 mph. Between the Ranger Station and Atlantic Drive, it is 45 mph. At Fort Hancock it is 25 mph.

Serious accidents and incidents between autos and other motorized vehicles and bicyclists have increased in recent years. An accident on Hartshorne Drive in 1996 resulted in death of a bicyclist. Bicycling is not promoted at the park because of safety issues. Skating is permitted in the Fort Hancock area only.

ENVIRONMENTAL CONSEQUENCES

The National Environmental Policy Act (NEPA) requires that planning disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the preferred alternative be implemented. This section presents the environmental impacts of two project alternatives on natural resources, cultural resources, and visitor experience. These analyses provide the basis for comparing the effects of the alternatives. The NEPA requires consideration of context, intensity and duration of impacts, indirect impacts, cumulative impacts, and measures to mitigate for impacts. NPS policy also requires that "impairment" of resources be evaluated in all environmental documents.

METHODOLOGY

Impacts are described in terms of type (beneficial or adverse), context (site-specific, local, or even regional), duration (short-term — lasting less than one year, long-term — lasting more than one year, or permanent), and intensity (negligible, minor, moderate, or major). Because definitions of intensity (negligible, minor, moderate, or major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this environmental assessment.

In addition, National Park Service's *Management Policies 2001* (NPS, 2000) require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid adversely impacting park resources and values or to minimize to the greatest degree practicable. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within park, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute impairment, but an impact would be more likely to constitute impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- key to the natural or cultural integrity of the park
- identified as a goal in the park's general management plan or other relevant NPS planning documents

Sand Dune

Intensity of impacts to sand dune is defined in terms of the extent of impact by area.

Negligible: the impact is at the lowest levels of detection. It is barely measurable and has no perceptible consequences.

Minor: the impact affects a small area, less than one acre for the entire project.

Moderate: the impact affects between one and 10 acres of sand dune.

Major: the impact affects a large area of sand dune

Plant Communities

The measure of impact for plant communities is similar to those for sand dune and relates to the extent of a particular community affected or the combined effect to all communities.

Negligible: the impact is at the lowest levels of detection with no perceptible consequences

Minor: the impact affects a small area, less than one acre for the entire project

Moderate: the impact affects between one and ten acres of plant community

Major: the impact affects a large area of plant community dune, exceeding 10 acres

Species of Concern

In accordance with language used to determine effects on threatened and endangered species under the federal Endangered Species Act (USFWS 1998), potential effects on species of concern are categorized as follows:

No effect: the proposed actions would not affect species of concern or critical habitat;

not likely to adversely affect: when effects on species of concern are discountable, insignificant, or completely beneficial; or

likely to adversely affect: when any adverse effect to listed species may occur as a direct or indirect result of proposed actions and the effect is not discountable or completely beneficial.

Archeological Resources

An archeological site may be eligible for inclusion in the National Register of Historic Places if the site has yielded, or may be likely to yield, information important in prehistory or history. An archeological site can be nominated to the National Register in one of three historic contexts or levels of significance: local, state, or national (see National Register

Bulletin #15, *How to Apply the National Register Criteria for Evaluation*) NPS 1991. For purposes of analyzing impacts to archeological resources, evaluation of the intensity of impact is based upon the potential of the site to yield information important in prehistory or history, as well as the historic context of the affected site:

Negligible: Impact is at the lowest levels of detection — barely measurable with no perceptible consequences, either adverse or beneficial, to archeological resources. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Minor: impact affects an archeological site(s) with the potential to yield information important in prehistory or history. The historic context of the affected site(s) would be local. For purposes of Section 106, the determination of effect would be *adverse effect.*

Moderate: impact affects an archeological site(s) with the potential to yield information important in prehistory or history. The historic context of the affected site(s) would be state. For purposes of Section 106, the determination of effect would be *adverse effect.*

Major: impact affects an archeological site(s) with the potential to yield important information about human history or prehistory. The historic context of the affected site(s) would be national. For purposes of Section 106, the determination of effect would be *adverse effect.*

Historic Structures/Buildings

In order for a structure or building to be listed in the National Register of Historic Places, it must be associated with an important historic context, i.e. possess significance — the meaning or value ascribed to the structure or building, *and* have integrity of those features necessary to convey its significance, i.e., location, design, setting, workmanship, materials, feeling, and association (see National Register Bulletin #15, *How to Apply the National Register Criteria for Evaluation,* NPS 1991). For purposes of analyzing potential impacts to historic structures/buildings, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact(s) is at the lowest levels of detection — barely perceptible and not measurable. For purposes of section 106, the determination of effect would be *no adverse effect.*

Minor: impact would not affect the character defining features of a National Register of Historic Places eligible or listed structure or building. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Moderate: impact would alter a character defining feature(s) of the structure or building but would not diminish the integrity of the resource to the

extent that its National Register eligibility is jeopardized. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Major: impact would alter a character defining feature(s) of the structure or building, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed in the National Register. For purposes of Section 106, the determination of effect would be *adverse effect.*

Cultural Landscapes

In order for a cultural landscape to be listed in the National Register, it must possess significance (the meaning or value ascribed to the landscape) *and* have integrity of those features necessary to convey its significance. The character defining features of a cultural landscape include spatial organization and land patterns; topography; vegetation; circulation patterns; water features; and structures/buildings, site furnishings and objects (see *The Secretary of the Interior's Standards for the Treatment of Historic Properties With Guidelines for the Treatment of Cultural Landscapes*, NPS, 1996). For purposes of analyzing potential impacts to cultural landscapes, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact(s) is at the lowest levels of detection - barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Minor: impact would not affect the character defining features of a National Register of Historic Places eligible or listed cultural landscape. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Moderate: impact would alter a character defining feature(s) of a cultural landscape but would not diminish the integrity of the landscape to the extent that its National Register eligibility is jeopardized. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Major: impact would alter a character defining feature(s) of a cultural landscape, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed in the National Register. For purposes of Section 106, the determination of effect would be *adverse effect.*

Visitor Experience

The measure of impact for the visitor experience is defined by how much of a change there is from the existing condition.

Negligible: there is little change from the current condition with regard to visitor experience.

Minor: the visitor experience improves or is degraded somewhat. The impact results in a change that is noticeable and measurable, but is not radically different from the current condition.

Moderate: the visitor experience changes to a noticeable degree.

Major: the visitor experience changes radically.

Safety

The measure of impact for safety is similar to that for visitor experience. It is based on how the incidence of accidents involving bicyclists and autos changes, either up or down.

Negligible: there is essentially no change in the frequency of accidents involving bicycles and automobiles, or the number of complaints from either user group. The change would be less than 5%.

Minor: there is a reduction or increase of accidents or complaints by visitors in the range of 5% to 10%.

Moderate: there is a reduction or increase of accidents or complaints by visitors in the range between 10% and 50%.

Major: there is a reduction or increase of accidents or complaints by visitors greater than 50%.

IMPACTS TO CULTURAL RESOURCES AND §106 OF THE NATIONAL HISTORIC PRESERVATION ACT

In this environmental assessment/assessment of effect, impacts to cultural resources (archeological resources, historic structures, the cultural landscape, ethnographic resources, and museum collections) are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA). These impact analyses are intended, however, to comply with the requirements of both NEPA and §106 of the National Historic Preservation Act (NHPA). In accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the NHPA (36 CFR Part 800, *Protection of Historic Properties*), impacts to cultural resources were identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources present in the area of potential effects that were either listed in or eligible to be listed in the National Register of Historic Places; (3) applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the National Register; and (4) considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations a determination of either *adverse effect* or *no adverse effect* must also be made for affected, National Register eligible cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualify it for inclusion in the National Register, e.g. diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the preferred alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis and Decision-making* (Director's Order #12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g. reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by §106 is similarly reduced. Although adverse effects under §106 may be mitigated, the effect remains adverse.

A §106 summary is included in the impact analysis sections for archeological resources, historic structures/buildings, and cultural landscapes under the preferred alternative. The §106 Summary is intended to meet the requirements of §106 and is an assessment of the effect of the undertaking (implementation of the alternative) on cultural resources, based upon the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

IMPAIRMENT

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. A determination on impairment is made in the *Environmental Consequences* section for each impact topic related to resources (sand dunes, plant communities, species of concern, archeological resources, historic structures/buildings, and cultural landscapes). Visitor experience and safety do not directly or indirectly affect the resources and values for which the park was established and no impairment statements are provided with these topics.

CUMULATIVE ACTIONS

The Council on Environmental Quality (CEQ, 1978) regulations, which implement the National Environmental Policy Act, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for both the no-action and Preferred Alternative alternatives.

Cumulative impacts were determined by combining the impacts of the alternatives with past, present, and reasonably foreseeable future actions. Therefore it was necessary to identify other ongoing or foreseeable future projects within Sandy Hook and, if necessary, the surrounding region.

For the purposes of this analysis, past actions include development of Fort Hancock and the road and utility systems at Sandy Hook. There are no present actions identified. Future actions include installation of electric and gas utility lines adjacent to Hartshorne Drive and a cyclic beach replenishment program currently under study. The beach replenishment project could result in the construction of a pipeline from Gunnison Beach to Area C at the south end of the park. There is a proposal to develop a ferry system to serve several Gateway National Recreation Area units, including Sandy Hook.

THE IMPACTS OF NO ACTION

IMPACTS ON THE LEAST TERN

Continued use of Hartshorne Drive by cyclists and pedestrians would have no impact on the least tern.

Cumulative Impact
Natural beach dynamics and beach replenishment projects have resulted in changes to nesting habitat. Management activities including monitoring, fencing, signing, staffing nest areas, and predator control all have had effects on nesting success. Various construction projects including beach center developments have required mitigation measures to avoid affects to least tern. Construction of the underground utilities and the pipeline for beach replenishment would not be expected to affect the least tern. This alternative would not contribute to cumulative effects to the least tern at Sandy Hook.

Conclusion
There would be no short-term or long-term impacts to the least tern. This alternative would not have a cumulative effect on the least tern.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON THE PIPING PLOVER

There would be no impact on the piping plover from this alternative, since no new construction would occur.

Cumulative Impact
Natural beach dynamics and replenishment projects have resulted in changes to nesting habitat. NPS and USFWS developed a piping plover management plan for Sandy Hook that has been implemented (NPS, 1992). Management activities by park staff including monitoring, fencing, signing, staffing nest areas, and predator control all have had beneficial effects on the nest success. Various construction projects including beach center developments have required mitigation measures to avoid affects to piping plover. The beach replenishment project would increase the nesting potential by restoring eroded habitat, a beneficial impact. The USFWS, as identified in their biological opinions, feel that beach replenishment on Sandy Hook has a negative impact on piping plover. Replenishment attracts them to an area with less favorable conditions (More visitors, steeper sloped beach, less food) and prevents the establishment of overwash plains which provide highly productive habitat. To mitigate potential negative impacts on piping plover, the USFWS recommends monitoring and protection of nests should piping plover resume nesting after replenishment or natural shoreline accretion (USFWS, 1998, 2000). The USFWS also recommends proper timing to avoid impacts during spring migration and nesting. Increased enforcement would also minimize adverse effects from visitor use. Construction of a fore dune would reduce the likelihood of overwash of nests. This alternative would not contribute to cumulative effects on the piping plover at Sandy Hook.

Conclusion
There would be no effect on piping plover from implementing this alternative, since no new construction would occur.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON OSPREY

There would be no adverse effects to the osprey associated with this alternative since there is no new construction activities.

Cumulative Impact
Various construction projects including beach center development and historic structure maintenance required mitigation measures to avoid affects to osprey. Several nesting platforms have been constructed in marsh areas. These platforms have successfully attracted osprey, and have been used continuously since being constructed. This has been a beneficial effect for osprey. Construction of the beach replenishment pipeline and installation of underground utilities would have no effect on osprey. In areas near active nests, construction would have to take place outside active nesting, brooding and rearing periods (April through August). This alternative would not contribute to cumulative effects to osprey at the park.

Conclusion
Under the No Action Alternative, there would be no impact on osprey since no new construction activities would occur.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON WILD WORMWOOD

No Action would impact on wild wormwood at the park because there would be no disturbance relating to construction.

Cumulative Impact
Wild wormwood is a disturbance-adapted species that readily colonizes disturbed areas that do not support a dense woody overstory. Throughout the decades, a variety of activities conducted by the Army and the NPS have created a habitat suitable for supporting this species. Such activities include construction and disturbance along roadsides and in developed areas that subsequently are permitted to convert to successional or unmaintained grasslands. Such areas are common throughout the park, including areas adjacent to Hartshorne Drive and the North Maintenance Area. Although ground-disturbing activities create conditions suitable to support wild wormwood, such actions also have destroyed plants. The net effect has been the development and expansion of the population, a moderate, long-term benefit. Installation of underground utilities and construction of the pipeline for beach replenishment would create disturbance that would also probably increase the population of

wild wormwood at Sandy Hook. This alternative would not contribute to cumulative effects to wild wormwood at Sandy Hook.

Conclusion
This alternative would have no impacts on wild wormwood, since no new construction would occur.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON PLANT COMMUNITIES

This alternative would result in no changes to the plant communities since no construction activities would occur.

Cumulative Impacts
Since the establishment of a military reservation at Sandy Hook in the mid-1800s, the Army constructed and deconstructed numerous buildings, roads, railroad lines, parking lots, target ranges, bunkers, camps, and other operational sites. At one time or another, practically every square foot of the Sandy Hook peninsula has been disturbed. Even areas inhospitable to humans, such as the interior marshlands south and east of Guardian Park, have been disturbed, as when the Army drained the marshlands during WWII. Areas came under human use, and when that use ended, reverted back to a natural state. Establishment of Gateway National Recreation Area has reduced the frequency and extent of disturbance, resulting in community stability and normal succession of plant communities.

Development of Fort Hancock and associated roads and park facilities resulted in the loss of 227 acres. Park facilities (parking lots and beach centers) affected mostly beachgrass dune and mixed grassland (about 33 acres). The Gunnison Parking area (about 1 acre) was constructed in woodland.

With the advent of NPS administration and management in 1974, some land-use zones have been developed for human use, such as the recreational beach zone, and some have been designated for the conservation of natural ecological processes, including habitat for natural vegetation and wildlife.

Based on a study of historical photos, maps, and accounts, approximately three times the quantity of habitat suitable for ecological processes exists on the peninsula today than existed during the high point of Army activity, during WWII.

This alternative would not contribute to cumulative impacts to plant communities.

Conclusion
Under the No Action Alternative, there would be no impacts to plant communities since no construction activities would occur.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON SAND DUNES

This alternative would have no effect on sand dunes, since no new construction would occur.

Cumulative Impact
Natural events and processes contribute to the dynamics of the beach and dune system at Sandy Hook. The southern end of the spit is particularly dynamic because of current strength and stabilization efforts south of the park. The construction of the seawall at the south end of the park to protect Hartshorne Drive has resulted in dune formation along its length. A 1000 foot long section of sheet piling was constructed north of Area C to prevent overwash of Hartshorne Drive The heavy erosion of the shoreline in this area made breach of the spit and loss of Hartshorne Drive a likely event. Installation of underground utilities and construction of the pipeline for beach replenishment would have no adverse effect on dunes. The beach replenishment project may contribute to dune formation by providing material. It is more likely dune material comes from winds blowing diagonally along the length of the spit. This alternative would not contribute to the cumulative impacts on sand dunes.

Conclusion
Under this alternative, there would be no impacts to sand dunes since no construction activities would occur.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON ARCHEOLOGICAL RESOURCES

Negligible impacts are expected to archeological resources as a result of the no action alternative. Weather, the unintentional actions of visitors unaware of the cultural value of the resource, and vandalism would continue to impact these types of resources.

Cumulative Impacts Ground disturbance has occurred continuously throughout Sandy Hook. Past actions, including agricultural use, ordinance testing, military development and recreation have obscured below ground resources. Few records exist of what may have been impacted in the past.

Planned development of a Sand slurry pipeline and sewer and water lines may traverse Sandy Hook within the approximate right-of-way proposed for the current undertaking. The recent (2001) realignment of Hartshorne resulted in no cultural resources being impacted. Burial of conduit for electrical lines and water pipelines in the Hartshorne Drive corridor has occurred. The likelihood for loss of contributing and non-contributing resources would be low. The US Coast Guard modified the Sandy Hook Lighthouse prior to 1980. The NPS made additional modifications in 1989 and rehabilitated the lighthouse in 2000.

This alternative would not contribute to the cumulative impacts to archeological resources.

Conclusion
The No-Action Alternative would have negligible effects on archeological resources since no new construction would occur.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON HISTORIC BUILDINGS AND STRUCTURES

Negligible impacts are expected to historic structures as a result of the no action alternative. Weather, the unintentional actions of visitors unaware of the cultural value of the resource, and vandalism would continue to impact these types of resources.

Cumulative Impact
Previous major impacts compromising the integrity to the historic fabric of Spermaceti Cove Life Saving Station resulted from significant rehabilitation efforts (1929-1930). The US Coast Guard performed extensive renovations to the interior of the Sandy Hook Lighthouse prior to 1980 that adversely affected the historic fabric. The National Park Service made additional modifications in 1989 and rehabilitated the lighthouse in 2000, which had no adverse effects on historic buildings and structures. Ongoing rehabilitation of structures within Fort Hancock before and since the National Park Service acquired the Sandy Hook have had minor to moderate impacts to buildings within Fort Hancock. As a result of the initiation of a Leasing Program of buildings at Fort Hancock, negligible to minor to moderate impacts have resulted.

Maintenance of other structures on the NPS *List of Classified Structures* would be expected to have negligible to moderate impacts to their current state. The cumulative impact would also likely not exceed a negligible to moderate level, either adverse or beneficial. Any cumulative effect would also likely not surpass a negligible to moderate level of either adverse or beneficial impacts on historic structures at the park.

This alternative would make a negligible contribution to the cumulative effects on historic buildings and structures.

Conclusion
The No-Action alternative would have negligible, short- and long-term direct or indirect impacts on the park's historic structures.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON CULTURAL LANDSCAPES

There would be no changes to the current state of the landscape of either the Fort Hancock District or the Halyburton Memorial, as a result of implementation of the No-Action alternative. Therefore, within these areas, negligible impacts would be expected to cultural landscapes.

Cumulative Impacts
The cumulative effect would not exceed a negligible condition. The cumulative effect is that no loss or change in cultural landscapes would be expected. Neither adverse nor beneficial on landscapes at the park are identifiable because no modification to the viewshed of the landscapes would occur.

Conclusion
Implementation of the No-Action would have negligible, short- or long-term impacts on the park's cultural landscapes, as no changes to the landscape would occur.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON VISITOR EXPERIENCE

The visitor would continue to access the beach areas and Fort Hancock by personal vehicle or tour bus. Visitors using bicycles would continue to use Hartshorne Drive to gain access to the same destinations. The visitor experience would be adversely affected to a moderate degree for the long-term. Visitors on bicycles would have to focus on safety issues while riding and some visitors would not be able to experience the park by bike. Use of the roadway creates a conflict of use and safety considerations adversely affecting the quality of the visitor experience.

Cumulative Effect
Paving the road system made the use of Sandy Hook for recreational purposes a possibility for many visitors. This was a major beneficial effect for the visitor experience. Development of a ferry system to serve Sandy Hook would improve the visitor experience because fewer visitors would have to drive. Some portion of visitors using the ferry system would bring bicycles as a means to access the beaches and other areas of interest. The ferry would also change use patterns, with visitors entering the park from a different threshold. It is not possible to characterize this effect until studies are complete. Completion of the Henry Hudson Pathway would also increase bike traffic entering the park. This increase in bicyclists would be a long-term adverse effect because all traffic would use Hartshorne Drive. The Fort Hancock Leasing Program would increase traffic on Hartshorne Drive, primarily during the week. This would have a negligible effect on the visitor experience. The no action alternative would result in bicyclist continuing to use the park roads. The moderate adverse effect on the quality of the visitor experience would continue under this alternative.

Conclusion
This alternative would not improve the visitor experience, since the conflict use between bicyclist and vehicles would continue. Hartshorne Drive and other roads at Sandy Hook would be used for more than one purpose, exceeding the design function and creating conditions that detract from the visitor experience for all visitors, both bicyclists and those in automobiles.

IMPACTS ON VISITOR SAFETY

This alternative would not address the safety issues of bicyclist and motorized vehicles sharing park roads. This alternative could potentially result in an increase in the frequency of incidents and accidents between motorized vehicles and bicyclists if the anticipated increase in bicyclists park roads occurs. This would be a moderate long-term adverse effect because it is undesirable to expose the visitor to undue risk of injury or death or involvement in an accident and would be inconsistent with NPS goals for visitor protection.

Cumulative Effect

Construction of the ferry terminal and the Henry Hudson Multiple-use Pathway would bring additional visitors to the park using non-motorized vehicles, leading to additional use of Hartshorne Drive. The Fort Hancock Leasing Program would also increase traffic within the park during off peak periods. There would be an increased likelihood for use conflicts and safety problems. This alternative would not address this conflict of uses on park roads, therefore potentially increasing the safety hazard.

Conclusion

This alternative would degrade the visitor safety to a moderate degree because use of Hartshorne Drive and other roads at Sandy Hook is anticipated to increase. Exceeding the design function and creating conditions that detract from increase the frequency of incidents between visitors. Additional use associated with development of the ferry terminal and the Henry Hudson Pathway would increase safety problems, a moderate long-term adverse effect.

IMPACTS OF THE PREFERRED ALTERNATIVE

IMPACTS ON LEAST TERN

Construction of the pathway is not likely to adversely affect the least tern; a species listed as endangered by the state of New Jersey. The pathway would be located away from nesting sites or would be designed so that path users are not visible or audible by terns from their nesting sites. In addition, as discussed in the mitigation section of this document, construction activity would not occur in areas in proximity to nesting areas during the breeding season (April 1-September 30).

Cumulative Impacts
Natural beach dynamics and replenishment projects have resulted in changes to nesting habitat, although most nesting areas in the park appear to be stable. Public use has adversely affected the least tern in some areas because people use the beach during the nesting season, disturbing nesting birds. Management activities by park staff including monitoring, fencing, signing, staffing nest areas, and predator control all have had moderate beneficial effects on nesting success. The management for the piping plover has incidental benefits for the least tern. Various construction projects including beach center developments have required mitigation measures to avoid affects to the least tern. Installation of underground utilities and construction of the beach replenishment pipeline would have no adverse effects on the least tern because they are not close to nesting and foraging areas. The beach replenishment project may improve habitat for the least tern. The no-action alternative would not contribute to cumulative effects to the least tern at the park.

Conclusion
The preferred alternative is not likely to adversely affect least tern because the pathway is far enough from nesting and foraging areas. Furthermore, construction activities would be limited during nesting season to further reduce the potential for impacts.

Impairment
Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Gateway National Recreation Area; (2) key to the natural or cultural integrity of the national recreation area; or (3) identified as a goal in the national recreation area's general management plan or other relevant National Park Service planning documents, there would be no impairment of the national recreation area's resources or values.

IMPACTS ON PIPING PLOVER

Construction of the pathway is not likely to adversely affect the piping plover; a species listed as threatened by the USFWS and as endangered by state of New Jersey. The pathway would be located away from nesting sites or would be designed so that path users are not visible or audible by plovers from their nesting sites. In addition, as discussed in the mitigation section of this document several mitigative measures would be implemented if this alternative were implemented. Construction activity would not occur in areas in proximity to nesting areas during the breeding season (April 1-September 30).

There may be some indirect benefits to plovers from the pathway. The trail may reduce the number of visitors walking through the intertidal zones between beach centers by providing an easier means to travel.

Cumulative Impacts
Natural beach dynamics and replenishment projects have resulted in changes to nesting habitat. The *Sandy Hook Piping Plover Management Plan Environmental Assessment* (NPS 1992) implemented specific actions to enhance the environment for piping plover. Management activities including beach closure, monitoring, fencing, signing, staffing nest areas, and predator control all have had beneficial effects on nesting success. Various construction projects including beach center developments have required mitigation measures to avoid affects to piping plover. Implementation of the management plan has had a long-term benefit for piping plover. The installation of underground utilities would not likely affect piping plover because the work at the south end has or would occur out of view from plover nest sites or outside the nesting and brooding season. The beach replenishment project, with the pipeline to carry the sand from Gunnison Beach to the eroded beach north of Area C would restore degraded habitat and potentially improve conditions for nesting in that area. If natural accretion or NPS replenishment activities result in nesting at the critical zone, mitigation identified in the management plan would be implemented to protect the nests. USFWS recommendations to mitigate beach replenishment activities would assure no adverse effect to piping plover. The preferred alternative would not contribute to cumulative effects to piping plover at the park.

Conclusion
The preferred alternative is not likely to adversely affect the piping plover. Mitigative measures would further reduce the potential for impacting plovers.

Impairment
Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Gateway National Recreation Area; (2) key to the natural or cultural integrity of the national recreation area; or (3) identified as a goal in the national recreation area's general management plan or other relevant NPS planning documents, there would be no impairment of the national recreation area's resources or values.

IMPACTS ON OSPREY

There would be no effect because the path would be located far enough away to have no influence on nesting sites. No temporary impacts associated with construction would be expected because construction would occur outside the breeding season as discussed in the mitigation section of this document (NJDEP, 2000a, 2000b).

Cumulative Impact
Resource management activities, including monitoring and the construction of nesting platforms, have resulted in increased nesting by osprey at Sandy Hook. Various construction projects including beach center development and historic structures maintenance has required mitigation measures to avoid adverse effects to osprey. The preferred alternative would not contribute to cumulative effects to osprey at the park.

Conclusion
The preferred alternative is not likely adversely affect osprey because the pathway would be designed to avoid nesting areas. In areas near osprey nests, construction activities would be limited to the non-breeding season, as discussed in the mitigation section of this document.

Impairment
Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Gateway National Recreation Area; (2) key to the natural or cultural integrity of the national recreation area; or (3) identified as a goal in the national recreation area's general management plan or other relevant National Park Service planning documents, there would be no impairment of the national recreation area's resources or values.

IMPACTS ON WILD WORMWOOD

Under the preferred alternative, approximately 3.7 acres of habitat suitable for supporting wild wormwood would be lost. This area consists of dunegrass, and scrub thicket. Development of the pathway would result in the loss of less than 1 % of the population, estimated to be approximately 100,000 plants with the park. The disturbance related to the construction activities is expected to create new habitat for this species. Mitigative measures will be implemented as described in the Alternatives section of this document. . The impacts of implementing this alternative are not likely to adversely affect the species.

Cumulative Impact
Wild wormwood is a disturbance-adapted species that readily colonizes disturbed areas that do not support a dense woody over-story. Throughout the decades, a variety of activities conducted by the U.S. Army and the National Park Service have created conditions suitable for supporting this species. Such activities include construction and disturbance along roadsides and in developed areas. Such areas are common throughout the park, and include those adjacent to Hartshorne Drive, parking lots, beach centers, and the South Maintenance Road. These activities have contributed to the increase in the size of the wild wormwood population in the park.

The preferred alternative would contribute to cumulative impacts affecting wild wormwood at the park by directly impacting approximately 3.7 acres of suitable habitat. However mitigative measures and the disturbance of additional areas from construction would reduce the overall impacts.

Conclusion
This plant is common in the park, and is neither federally nor state listed as threatened or endangered. It is uncommon in the state, and the State of New Jersey identifies it as a Species of Special Concern. Because the plant is common in the park, and thrives in disturbed areas such as at the sides of roads, this alternative is not likely to adversely affect the population in the park.

Impairment
Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Gateway National Recreation Area; (2) key to the natural or cultural integrity

of the national recreation area; or (3) identified as a goal in the national recreation area's general management plan or other relevant National Park Service planning documents, there would be no impairment of the national recreation area's resources or values.

IMPACTS ON PLANT COMMUNITIES

The preferred alternative would result in the loss of the following:

Plant Community	Area (acres)
Grassland	
Mixed Grassland	1.92
Beach Heath	0.06
Shrub	
Low Thicket	1.38
Woodland	
High Thicket	1.30
Woodland	1.40
Total	6.06

The loss of approximately 6 acres of various community types would be a long-term moderate adverse impact on plant communities. The plant communities that would be impacted by this project are relatively abundant in the park. The moderate adverse impacts would be reduced to minor with the implementation of mitigation as discussed in mitigation section of this document.

There would be no change in the total acreage affected by selecting either of the route options at the visitor center or Horseshoe Cove. The route along the west side of parking lot E would travel through more woodland and less shrub thickets than the roadside route. In Horseshoe Cove both options are through woodland. However, widening the northbound lanes for two way traffic would eliminate the existing forest canopy. No canopy exists along the water on the southbound side.

Cumulative Impact

Since the 1600's there have been a variety of activities that have influenced the vegetation on Sandy Hook. Logging of cedar trees and construction of roads, rail lines, and buildings to support the development of the Army ordnance proving ground and coastal defense fortifications resulted in the change and loss of habitat. Development reached a peak during World War II when 18,000 people lived on Sandy Hook. Development of Fort Hancock and associated roads and park facilities resulted in the loss of 227 acres. Park facilities (parking lots and beach centers) affected mostly beachgrass dune and mixed grassland (about 33 acres). The Gunnison Parking area (about 1 acre) was constructed in woodland.

Natural ecological processes have reclaimed much of what was once the site of military structures and facilities and the proving grounds. The National Park Service has continued to remove non-historic elements from Sandy Hook and has allowed re-growth of native vegetation in these areas. Recent development of park facilities has been primarily reconstruction within the same footprint or in areas that previously were disturbed. Sand replenishment has resulted in an increase in land area and the early phase of barrier beach

succession. While some habitat has been lost to development, and the construction of the multiuse path would result in the loss of 6.06 acres of plant communities, the net cumulative effect has been a reduction in disturbed areas and an increase in natural vegetation.

Placing utilities underground would have little effect on plant communities because they would be placed along roadsides where vegetation is mowed and woody vegetation prevented from becoming established. Such areas would maintain a mixed grassland character.

The preferred alternative would have a minor contribution to the cumulative impacts on the plant communities of the park.

Conclusion
Approximately 6 acres of habitat would be impacted by construction. The design and location of the trail would minimize the extent of impact. No habitat fragmentation would occur, and the vegetation canopy would be preserved in an effort to prevent sunlight intrusion that could alter communities. Despite the impacts, the design and mitigation actions would allow each of the vegetation communities to continue to function. Although development of the pathway would result in long term adverse impacts, the mitigation would reduce these impacts from moderate to minor.

Impairment
Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Gateway National Recreation Area; (2) key to the natural or cultural integrity of the national recreation area; or (3) identified as a goal in the national recreation area's general management plan or other relevant National Park Service planning documents, there would be no impairment of the national recreation area's resources or values.

IMPACTS ON SAND DUNES

There would be no permanent impacts to the dune system. A section of dune approximately 1300 feet long would be re-contoured to accommodate the path. This would result in the disturbance of about 0.75 acres of dune. This minor short-term adverse impact is included in the mixed grassland category of impacts to plant communities.

Cumulative Impact
Groins and other beach protection structures have caused sand deficits in some areas, resulting in the loss of shoreline and dune. Beach replenishment projects have included mechanical reconstruction or resulted in reestablishment of dunes by natural processes. In other areas, dunes have been reconstructed to protect facilities and vehicle access. This has resulted in moderate beneficial impacts to dunes. Planting dunegrass has stabilized some dunes. Other considerations, such as endangered shorebird nesting areas, also have also benefited dunes within the park.

Constructing 1,300 feet of trail through dunes at the south end of the park would not contribute to the cumulative actions that affect the dune systems because the disturbance to dunes would be mitigated by reestablishing them immediately east of their current location.

Conclusion
The dune system would continue to perform the function of protecting park structures and other natural habitats from storm events. The preferred Alternative would have a minor long-term impact on sand dunes.

Impairment
Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Gateway National Recreation Area; (2) key to the natural or cultural integrity of the national recreation area; or (3) identified as a goal in the national recreation area's general management plan or other relevant National Park Service planning documents, there would be no impairment of the national recreation area's resources or values.

IMPACTS ON ARCHEOLOGICAL RESOURCES

The existence, integrity, and eligibility for inclusion in the NRHP for archeological resources along the corridor are unknown. A survey and limited testing program to identify archeological materials within the area defined is planned but has not yet been performed. The archeological fieldwork will be conducted in order to determine if any historic properties are present and to provide sufficient information to comply with the requirements of Section 106 of the NHPA and the Advisory Council on Historic Preservation's regulations 36 CFR 800.

Description of Survey and Limited Testing
Based on previous archeological investigations, disturbance and geomorphological factors already identified, the area of the corridor may be classified into three levels of probability for encountering archeological resources. Sections of the corridor with high probability would require subsurface archeological testing prior to construction and possible monitoring during construction. Moderate probability areas would require full-time monitoring by an archeologist during construction activities involving earth moving. Low probability sections would not require on-site monitoring. However, should construction activity lead to the discovery of cultural manifestations such as artifacts or features, the Park's cultural resources representative or the Contracting Officers Representative would be notified and action consistent with 36 CFR 800.12 would be taken.

Discovery of artifacts and other subsurface materials, or intact soil strata revealed during shovel testing, indicating the presence of archeological resources possibly eligible to be listed in the National Register of Historic Places, would necessitate additional shovel tests or larger formal test units. However, only limited excavation would be undertaken to provide detailed information regarding an identified feature or concentration of artifacts. All excavations at a location would cease as soon as it can be determined if the site possesses the elements necessary for its consideration as being eligible for inclusion in the National Register.

Because it is unlikely that any archeological site encountered would be eligible to be listed in the National Register at a national historic context, any adverse impacts to archeological resources would be of minor to moderate intensity and long term.

Cumulative Effects
Planned development of a pipeline for beach replenishment and gas and electrical lines may follow Hartshorne Drive. Burial of conduit for electrical lines and water pipelines in the Hartshorne Drive corridor has occurred from the Fee Plaza to Spermaceti Cove Life Saving Station. The recent (2001) realignment of Hartshorne Drive resulted in no negative impacts to cultural resources.

This alternative would have negligible contribution to the cumulative impacts on the archeological resources of the park.

Conclusion
National Register eligible archeological resources would be avoided whenever possible. If such resources could not be avoided, all proposed documentation/recordation and mitigative measures would be stipulated in a Memorandum of Agreement between Gateway National Recreation Area and the New Jersey state historic preservation office. Any adverse impacts to archeological resources would be minor to moderate intensity and long term.

§106 Summary: After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service determines that implementation of the preferred alternative may have an *adverse effect* on archeological resources eligible to be listed in the National Register of Historic Places. If National Register eligible archeological resources would be affected, a memorandum of agreement, in accordance with 36 CFR Part 800.6[c], *Resolution of Adverse Effects-Memorandum of Agreement*, would be executed and implemented between Gateway National Recreation Area and the New Jersey state historic preservation officer (and/or the Advisory Council on Historic Preservation, if necessary). The memorandum of agreement would stipulate how the adverse effects would be mitigated, e.g. data collection.

Impairment
Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Gateway National Recreation Area; (2) key to the natural or cultural integrity of the national recreation area; or (3) identified as a goal in the national recreation area's general management plan or other relevant National Park Service planning documents, there would be no impairment of the national recreation area's resources or values.

IMPACTS ON HISTORIC STRUCTURES/BUILDINGS

Because of their distance and lack of direct or indirect impact from the proposed MUP, no additional loss of historic properties would be expected. Implementation of the construction of the MUP would have negligible impacts to any structures.

Cumulative Impacts
Construction of modern structures within the *Fort Hancock and Sandy Hook Proving Ground Historic District* by the National Park Service have been limited to parking lots and special use structures necessary for facility management. These constructions have been generally limited to the Hartshorne Drive Corridor and Gunnison beach areas. Impacts resulting from these constructions have been major and permanent.

Conclusion Historic Structures/Buildings
The preferred alternative would have negligible, direct or indirect impacts of either short-or long-term duration to the park's historic structures. There would be no resultant deterioration of historic structures.

§106 Summary: After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service determines that implementation of the preferred alternative would have *no adverse effect* on historic structures/buildings.

Impairment
There would be no impairment of park resources or values.

IMPACTS ON CULTURAL LANDSCAPES

Fort Hancock
The proposed route for the MUP entering from the south at "Guardian Park" would proceed north along Hartshorne Drive paralleling Officers Row along the west shoulder of Hartshorne Drive. The MUP would be placed as near the shoulder of Hartshorne Drive as would be feasible. Placement of the MUP in this location would have a minor permanent impact to the viewshed of the landscape. However the restoration of the privet hedge (described in the Mitigation section of this documents), missing landscape element would minimize the impact to the landscape.

Cumulative Impacts
Fort Hancock's landscape successfully conveys a sense of past time and place and is considered to have a high degree of integrity when considered as a whole. However, numerous buildings from the period of significance have been constructed and removed. Nevertheless, the Fort retains many of the distinctive characteristics of its original construction.

As stated earlier, in compliance with Section 106 of the NHPA, detailed recommendations and plans for mitigating any adverse effects to NRHP eligible cultural resources must be provided to the New Jersey SHPO to allow them the opportunity to comment. There has been initial consultation with the New Jersey SHPO on appropriate mitigation measures for cultural landscapes. The appropriateness of the proposed mitigation can not be assessed until after completion of consultation with the New Jersey SHPO regarding the reintroduction of the historic privet hedge. Based on the results of completed consultation with the NJ SHPO, appropriate mitigation measures would be put into effect.

Conclusion
Based on the general factors of the proposed mitigation strategy, the preferred alternative would have minor, short-term adverse impacts on the viewshed of the historic landscape. These impacts would be limited to the period of construction and growth of the hedge. The project would have long-term, minor, beneficial effects through the reestablishment of hedge, a missing historic element of the landscape.

§106 Summary: After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service determines that implementation of the preferred alternative would have *no adverse effect* on cultural landscapes.

Impairment
There would be no impairment of park resources or values.

Halyburton Monument
The eastern boundary of the memorial landscape is a row of planted cedars. The primary access to the monument is from a parking lot just south on the east-side of Hartshorne Drive. It is proposed that the MUP approach the Memorial from the south. The MUP would then cross into the interior of the Memorial and proceed towards the retaining wall on the west. The path would parallel the stone retaining wall, cross the flagstone path leading to the monument cairn, and continue northward until the path exits the boundary of the memorial on the north side.

Impacts would be adverse, moderate and permanent. These impacts would result from the placement of the MUP through the western edge of memorial along the stone wall. Impacts would directly alter the condition of the open space of the monument contained within the boundaries. It would also alter the view of the landscape by visitors to the Memorial. Indirect impacts resulting from increased visitation as a result of improved access through the memorial from the path would be negligible but permanent.

The adverse impacts resulting from placing the MUP across the Halyburton Memorial would be mitigated by designing the MUP to run as close to the existing flagstone wall as is possible given necessary pedestrian safety considerations. Additionally, the surface of the MUP would be constructed of tightly placed flagstone–a sympathetic but different material type that is used in the construction of the memorial. No asphalt surfacing or other construction material exposed to view would be used within the limits of the Memorial.

Cumulative Impacts
No known impacts resulting from previous or proposed actions have been identified. Therefore, no impacts other than those directly associated with the proposed alternative would be expected.

Conclusion
The preferred alternative would have a direct, moderate, permanent impact on the designed cultural landscape as a result of altering character defining features of the designed landscape.

Section 106 Summary

The placement of the MUP across the open "Park" of the Halyburton Memorial would result in a moderate adverse effect to the property. This effect would result from the alteration of the original design layout of the memorial. Consideration was given to routing the path immediately "behind" the memorial to the east of the cedar tree boundary. It is currently thought that archeological deposits are present further to the east of the memorial. However, consideration of this option was discarded because of the uncertainty as to whether those deposits extend up to the memorial. It is proposed that the mitigation activities identified in the *Mitigation* section above would be sufficient to not jeopardize the National Register eligibility of the resource. After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*), the National Park Service determines that implementation of the preferred alternative would have *no adverse effect* on cultural landscapes.

Impairment
Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Gateway National Recreation Area; (2) key to the natural or cultural integrity of the national recreation area; or (3) identified as a goal in the national recreation area's general management plan or other relevant National Park Service planning documents, there would be no impairment of the national recreation area's resources or values.

IMPACTS ON VISITOR EXPERIENCE

The visitor experience would expand to allow alternative transportation opportunities on the pathway. This would be a moderate beneficial effect because those visitors using the pathway would have an opportunity for a more natural and recreational experience and visitors could use alternate modes to access the park. This is consistent with the NPS desire to have the visitor experience the park at the natural level.

Different experiences would result depending on the option selected along the preferred route at the visitor center and Horseshoe Cove. The pathway along the west edge of area E is away from the roadway, provides better access to park facilities, and travels through more woodland but may diminish bird watching opportunities. At Horseshoe Cove, the bird watching opportunities and the forested canopy is a desirable feature that would be lost if the road were widened for two way traffic. If widened southbound, quiet water views and access for fishing would compete with roadway traffic.

Cumulative Effect
The road system developed in association with Fort Hancock and military use made the access of Sandy Hook for recreational purposes a possibility. This was a major beneficial effect for the visitor experience. Development of a ferry system to serve Sandy Hook would improve the visitor experience because fewer visitors would not have to drive to the park. Some portion of visitors using the ferry system would bring bicycles as a means to access the beaches and other areas of interest. This would be a moderate benefit for the visitor experience because it would provide options and opportunity for a varied experience. This alternative would add to the range of visitor experience by providing safe alternative means and routes to enjoy the park. Combined with current access and visitor experience, this would be a moderate addition to the long-term beneficial cumulative effect.

Conclusion
This alternative would enhance the visitor experience to a moderate degree because the visitor would have alternate methods to use and enjoy the park. This impact would be long-term and beneficial.

IMPACTS ON VISITOR SAFETY

Development of the multiuse pathway would allow bicyclists use of a safe means to traverse the park by providing separation from the roadway. The majority of bicyclists using the path would be Groups B and C (as defined in the Affected Environment section). This would be a moderate long-term benefit because bicyclists in these groups have less experience riding in traffic and the risk of an accident is higher. In order to gain speeds necessary for training, Group A bicyclists (as defined in the Affected Environment section) would probably continue using the roadway. Visitors on bicycles would have less conflict with traffic on Hartshorne Drive and other park roads, improving safety to a moderate degree for the long-term. The preferred alternative would also reduce the risk of collision with bicyclists for those in automobiles, a moderate beneficial impact.

Differences in safety afforded by the two route options at the visitor center and Horseshoe Cove are minimal. At Horseshoe Cove the Hartshorne Drive crossover near Randolph Drive would be along a curved portion of roadway with limited visibility. If the southbound roadway were widened for two-way traffic visitors accessing the water for fishing and other activities would require walking along the roadway.

Cumulative Effect
Development of the four-lane roadway system from the south end of the park to Fort Hancock set the stage for conflicting use of facilities. This was a moderate adverse impact. The number of bicyclists using the road system was low prior to 1990. The increased use has generated a corresponding increase of safety concerns. Construction of the multiuse pathway would reduce the cumulative effect by ameliorating the adverse effects of this developing use. The cumulative effect would be a moderate, long-term, and beneficial because the risk of being involved in an accident would be reduced.

Conclusion
Although some safety issues would remain, i.e., pathway users crossing access to parking lots, the most severe concern of mixed use of the roadway would be removed. This would be a moderate beneficial effect on visitor safety.

PUBLIC INVOLVEMENT

This EA is being placed on formal public review for 30 days and will be distributed to a variety of agencies and organizations, including those listed below under "Consultation and Coordination". In addition, the National Park Service invited and was joined by representatives of the U.S. Fish and Wildlife Service and New Jersey Department of Environmental Protection for a site visit conducted at the park on May 16, 2000.

CONSULTATION AND COORDINATION

The following agencies were contacted and/or consulted during preparation of this EA:

U.S. Army Corps of Engineers, New York District (Corps). In accordance with the Clean Water Act, the National Park Service contacted the Regulatory Branch of the Corps (Sophie Ettinger) to discuss wetland issues in the project area as part of a project to rehabilitate approximately one mile of Hartshorne Drive (March 8, 2000). The pathway was discussed at the same time.

Although the preferred alternative evaluated in this EA would not affect wetlands and, therefore, does not require a Department of the Army permit, the National Park Service has submitted a copy of this EA to the Corps for review and comment.

U.S. Fish and Wildlife Service, New Jersey Field Office (USFWS). The National Park Service initiated informal consultation with the USFWS and the USFWS (Wendy Walsh) participated in a site visit / scoping meeting at the park to discuss the project early in the planning process on May 16, 2000. A June 5, 2000, letter received from USFWS listed species of concern of potential concern at the park and recommendations for eliminating or minimizing potential project effects (Appendix A). The USFWS also provided a copy of its April 15, 1994, Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act (USFWS, 1994). The National Park Service obtained additional information concerning endangered species in the project area from the USFWS internet site listing species by state at 'http://endangered.fws.gov/statl-r5.html' and from other internet sites, including sites posted by the USFWS, U.S. Geological Survey's Biological Resources Division, and the New Jersey Department of Environmental Protection (see references).

The National Park Service has incorporated the USFWS recommendations into the preferred alternative to ensure it is not likely to adversely affect federally threatened or endangered species, including Piping Plover. The National Park Service is submitting a copy of this EA to the USFWS and requesting concurrence with the National Park Service determination that the preferred alternative is not likely to adversely affect piping plover or other federally listed species.

New Jersey Department of Environmental Protection, Land Use Regulation (NJDEP). The NJDEP (Chris Dolphin) participated in a site visit / scoping meeting at the park to discuss the project early in the planning process on May 16, 2000. In addition, representatives from the NJDEP met with NPS personnel at the park on April 14, 2000 to identify jurisdictional wetlands in the southern part of the project area during surveys completed for a project to rehabilitate approximately one mile of Hartshorne Drive.

The National Park Service obtained additional information, including New Jersey's Coastal Zone Management Plan, from NJDEP Internet site at 'http://www.state.nj.us/dep/landuse/coast/coast.html'. In accordance with the Coastal Zone Management Act, the NPS has submitted a copy of this EA to the NJDEP and requested concurrence with its determination that the preferred alternative is consistent with New Jersey's Coastal Zone Management.

New Jersey Division of Fish, Game, and Wildlife (NJDFGW). The National Park Service contacted the Endangered and Non-game Species Program (Dave Jenkins) and the Natural Heritage Program (Dave Snyder) in November 2000 to discuss species of concern to the State at the park during planning for a project to adaptively re-use Fort Hancock. The NJDFGW provided information to ensure the preferred alternative is not likely to adversely affect species of State concern, including osprey and Piping Plover.

The National Park Service obtained additional information on special status of concern to the state from Internet sites, including the Natural Resource Conservation Service's PLANTS Database at http://plants.usda.gov/plants. The National Park Service has submitted a copy of this EA to the NJDFGW for review and comment.

New Jersey Office of Historic Preservation (SHPO). Section 106 of the National Historic Preservation Act of 1966 (as amended) requires a federal agency to take into account the effects of its undertakings on properties listed on or eligible for inclusion in the National Register of Historic Places (NRHP). This is accomplished through the provisions of the Advisory Council on Historic Preservation's (ACHP) implementing regulations (36 CFR 800). These regulations provide the State Historic Preservation Office (SHPO) a reasonable opportunity to comment on the affect of an undertaking on historic properties within the area of potential effect. The National Park Service has informally consulted with the SHPO concerning the routing of the pathway and the necessary archeological testing and monitoring. The National Park Service has submitted a copy of the EA to the SHPO for review and comment.

COMPLIANCE FRAMEWORK

The following laws and associated regulations provided direction for the design of project alternatives, the analysis of impacts and the formulation of mitigation / avoidance measures:

National Environmental Policy Act of 1969 (NEPA) (Title 42 U.S. Code Sections 4321 to 4370 [42 USC 4321-4370]). The purposes of NEPA include encouraging "harmony between [humans] and their environment and promote efforts which will prevent or eliminate damage to the environment...and stimulate the health and welfare of [humanity]." The purposes of

NEPA are accomplished by evaluating the effects of federal actions. The results of these evaluations are presented to the public, federal agencies, and public officials in document format (e.g., environmental assessments and environmental impact statements) for consideration prior to taking official action or making official decisions. Implementing regulations for the NEPA are contained in Part 1500 to 1515 of Title 40 of the U.S. Code of Federal Regulations (40 CFR 1500-1515).

Clean Water Act of 1972, as amended (CWA) (33 USC 1251-1387). The purposes of the CWA are to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers (Corps) has been charged with evaluating federal actions that result in potential degradation of waters of the U.S. and issuing permits for actions consistent with the CWA. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the U.S. Implementing regulations describing the Corps' CWA program are contained in 33 CFR 320-330. The no-action alternative would not affect waters of the U.S. regulated under the CWA and the Preferred Alternative has been designed to avoid placement of fill in jurisdictional waters of the U.S. Therefore, no Department of the Army permit (i.e., Section 404 permit) is required.

Coastal Zone Management Act of 1972 (CZMA) (16 USC 1451-1464). The CZMA presents a congressional declaration to "preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations." The CZMA also encourages "states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone". In accordance with the CZMA, the State of New Jersey has adopted state laws and regulations, including a Coastal Zone Management Plan, which is administered by the New Jersey Department of Environmental Protection (NJDEP). All actions proposed by federal, state, and local agencies must be consistent with the Coastal Zone Management Plan, as determined by the NJDEP. The NPS has requested concurrence from the NJDEP that the Preferred Alternative is consistent with the New Jersey Coastal Zone Management Plan.

Endangered Species Act of 1973, as amended (ESA) (16 USC 1531-1544). The purposes of the ESA include providing "a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved". According to the ESA, "all Federal departments and agencies shall seek to conserve endangered species and threatened species" and "each Federal agency shall. . .insure that any action authorized, funded, or carried out by such agency. . .is not likely to jeopardize the continued existence of any endangered species or threatened species". The U.S. Fish and Wildlife Service (non-marine species) and the National Marine Fisheries Service (marine species, including anadromous fish and marine mammals) administer the ESA. The effects of any agency action that may affect endangered, threatened, or proposed species must be evaluated in consultation with either the USFWS or NMFS, as appropriate. Implementing regulations which describe procedures for interagency cooperation to determine the effects of actions on endangered, threatened, or proposed species are contained in 50 CFR 402. The NPS has requested concurrence from the USFWS that the Preferred Alternative is not likely to adversely affect the threatened Piping Plover.

National Historic Preservation Act of 1966, as amended (NHPA) (16 USC 470 *et sequentia*). Congressional policy set forth in the NHPA includes preserving "the historical and cultural foundations of the Nation" and preserving irreplaceable examples important to our national heritage to maintain "cultural, educational, aesthetic, inspirational, economic, and energy benefits." The NHPA also established the National Register of Historic Places composed of "districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture." Section 106 of the NHPA requires that federal agencies take into account the effects of their actions on properties eligible for or included in the National Register of Historic Places, and permit the Advisory Council on Historic Preservation an opportunity to review such actions. Federal agencies consult as appropriate with state historic preservation officers, tribal historic preservation officers or representatives, and other interested parties in fulfilling Section 106 requirements. Section 106 further requires federal agencies to propose and evaluate alternatives to undertakings that would adversely affect historic properties, or to adequately mitigate adverse effects if avoidance cannot be reasonably achieved. Section 110 of the NHPA requires federal agencies, in consultation with the state historic preservation officer, to locate, inventory, and nominate all properties that appear to qualify for the National Register of Historic Places. It also requires federal agencies to manage and maintain historic properties under their jurisdiction in a manner that considers the preservation of historic, archeological, architectural, and cultural values.

APPENDIX A: RESPONSE FROM U.S. FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
927 North Main Street (Bldg. D1)
Pleasantville, New Jersey 08232

Tel: 609-646-9310
FAX: 609-646-0352

IN REPLY REFER TO:

ES-00/209

June 5, 2000

Mr. Chris Davis
National Park Service
Denver Service Center
P.O. Box 25287
Denver, Colorado 80225-0287

Dear Mr. Davis:

Thank you for providing the U.S. Fish and Wildlife Service (Service) the opportunity to participate in the Pathways Project meeting on May 16, 2000 at the Sandy Hook Unit of the Gateway National Recreation Area (Sandy Hook), Monmouth County, New Jersey. The Service encourages federal planners to initiate informal consultation early in project planning to avoid adverse impacts to federally listed endangered and threatened species. The National Park Service (NPS) has engaged in such early consultation for the proposed Pathways Project by involving the Service in this preliminary planning phase.

This letter provides initial Service comments on the proposed Pathways Project based on the Preliminary Scoping Summary and discussion at the May 16 meeting. The Service understands that the proposed project will involve the construction of a multi-use paved bicycle and pedestrian path running nearly the entire length of Sandy Hook.

AUTHORITY

This response is provided pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of federally listed endangered and threatened species and does not address all Service concerns for fish and wildlife resources. These comments do not preclude separate review and comments by the Service as afforded by the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 *et seq.*), if project implementation requires a permit from the U.S. Army Corps of Engineers pursuant to the Clean Water Act of 1977 (33 U.S.C. 1344 *et seq.*), nor do they preclude comments on any forthcoming environmental documents pursuant to the National Environmental Policy Act (NEPA) of 1969 as amended (83 Stat. 852; 42 U.S.C. 4321 *et seq.*).

GENERAL COMMENTS

The Service supports the project goal, as stated in the Preliminary Scoping Summary, of encouraging the use of alternative transportation by Sandy Hook visitors. As addressed in the Preliminary Scoping Summary, the Service encourages the NPS to minimize impacts to wetlands, beach/dune areas, maritime forests, and other sensitive habitats. As the proposed pathway is a linear project, particular care should be taken to avoid fragmenting contiguous blocks of habitat. Existing roads, parking lots, rights-of-way, railroad beds, and other disturbed areas should be used wherever possible to minimize any construction in previously undisturbed areas. The design of the path should direct visitors to established developed recreational and historic centers, and away from sensitive natural areas and occurrences of State or federally protected species. The Service supports steps to protect and accommodate unlisted wildlife, such as a path design that will not impede crossings by diamondback terrapins *(Malaclemys terrapin)* or small mammals.

FEDERALLY LISTED SPECIES

The Service understands that the target user groups (*i.e.*, hikers, birders, cyclists, families) and intended uses (*i.e.*, pedestrian, bicycle, in-line skating) of the proposed pathway have not yet been clearly delineated at this early planning phase of the project. Since these decisions will likely affect the route, width, and design of the path, as well as the type and volume of expected uses, the Service cannot fully assess the potential impacts of the proposed pathway on federally listed endangered and threatened species at this time. However, general comments are provided below to assist in project planning. More detailed project information will be necessary before the Service can complete consultation pursuant to Section 7 of the ESA for the Pathways Project.

PIPING PLOVER

The federally listed (threatened) piping plover *(Charadrius melodus)* nests on several Sandy Hook beaches. A map of Sandy Hook piping plover nesting areas is enclosed, depicting current information provided by Jean MacArthur of the Sandy Hook NPS staff.

Piping plovers, small, territorial shorebirds, are present on the New Jersey shore between March and August. Piping plovers nest above the high tide line, usually on sandy ocean beaches and barrier islands, but also on gently sloping foredunes, blowout areas behind primary dunes, washover areas cut into or between dunes, the ends of sandspits, and deposits of suitable dredged or pumped sand. Piping plover nests consist of a shallow scrape in the sand, frequently lined with shell fragments and often located near small clumps of vegetation. Piping plover adults and chicks feed on marine invertebrates such as worms, fly larvae, beetles, and crustaceans. Feeding areas include the intertidal zone of ocean beaches, ocean washover areas, mudflats, sandflats, wrack lines (organic ocean material left by high tide), and the shorelines of coastal ponds, lagoons, and salt marshes.

Threats to the piping plover include habitat loss, human disturbance of nesting birds, predation, and oil spills and other contaminants. Habitat loss results from development, as well as from beach stabilization, beach nourishment, and other physical alterations to the beach ecosystem. Human disturbance of nesting birds includes foot traffic, sunbathing, kite flying, pets, fireworks displays, beach raking, construction, and vehicle use. These disturbances can result in crushing of eggs, failure of eggs to hatch, and death of chicks. Predation on piping plover chicks and eggs is intensified by development because predators such as foxes, gulls, and raccoons thrive in developed areas, and are attracted to beaches by food scraps and trash. Unleashed and feral dogs and cats also prey on piping plover chicks and eggs.

The Service understands that the NPS currently conducts an extensive piping plover management program on Sandy Hook beaches, including fencing and monitoring nesting areas and closing nesting areas to the public while chicks are present.

Since precise information regarding the location of piping plover nesting areas is necessary to fully assess potential impacts of the Pathways Project, the Service recommends using a Global Positioning System (GPS) to map nesting areas. The Service can provide some technical assistance for mapping, including staff time and use of a GPS devise. An accurate and current map depicting all Sandy Hook nesting areas used by piping plovers in the past 5 years, shown in relation to proposed pathway routes, will be necessary before the Service can complete consultation pursuant to Section 7 of the ESA. The Service recommends including such a map in the Environmental Assessment (EA) prepared for this project pursuant to NEPA.

Potential impacts to the piping plover from the Pathways Project are addressed by nesting area, as marked on the enclosed map. The primary concerns are: (1) direct disturbance of nesting birds from pathway use in the Fee Beach, Hidden Beach, and Critical Zone areas; and (2) increased visitor access to the South Gunnison, North Gunnison, North Beach, and U.S. Coast Guard areas.

Fee Beach and Hidden Beach

The southern end of the proposed pathway passes closest to piping plover nesting areas, within 50 meters of the Fee Beach and Hidden Beach areas. The Service's "Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act" (enclosed) recommends closing an area of beach within a 50-meter radius of a piping plover nest. This distance may need to be greater if heavy recreational use continues to disturb nesting birds at 50 meters, but may be less if a visual barrier prevents disturbance to birds at less than 50 meters. On Sandy Hook beaches, this guidance applies not only east toward the Atlantic Ocean, but west toward the proposed bike path.

The option discussed at the May 16 meeting of locating the path on top of the seawall is likely to adversely affect the piping plover. By directing a flow of bicyclists and pedestrians within 50

meters of a nesting area, within the birds' line-of-sight, a path on top of the seawall can reasonably be expected to disturb nesting birds. Piping plovers have been shown to react to humans as predators, leaving their nests or chicks unguarded while attempting to lure the people away (U.S. Fish and Wildlife Service, 1996). This leaves eggs or chicks vulnerable to overheating and to predation. High levels of disturbance from recreational activities can reduce piping plover reproductive success.

Thus, location of the path on top of the seawall may violate Section 9 of the ESA, which prohibits any person from taking listed wildlife species. "Taking" includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting the species; attempting to engage in such conduct; or, soliciting or causing such acts to be committed. Regulations implementing the ESA (50 CFR 17.3) further define "harass" as an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include but are not limited to, breeding, feeding, or sheltering.

Locating the path west of and behind the seawall would remove bicyclists and pedestrians from the birds' line-of-sight, and thus eliminate disturbance, provided that the following steps are taken:

(1) no construction should occur during the nesting season, April 1 to September 1;
(2) no beach accesses or pathway amenities, which would encourage visitors to linger (e.g., drinking fountains, benches, bike racks), should be provided in front of nesting areas; and
(3) signs and fencing should be erected along the path to prohibit visitors from crossing over the seawall into nesting areas.

Locating the path on the bay side of Hartshorne Road in the vicinity of Fee Beach and Hidden Beach is not a preferred alternative with regard to piping plovers, as birds utilize bay-side beaches as feeding areas. With limited space west of Hartshorne Road, a pathway between the road and the bay-side beach could be expected to impact the beach habitat and thus piping plover feeding areas.

Critical Zone

Piping plovers have not nested in the Critical Zone since 1996 because the beach has eroded to the point where suitable habitat no longer exists. However, if this beach is nourished in the future, piping plovers can reasonably be expected to return to the Critical Zone. Therefore, steps 2 and 3 recommended above for Fee Beach and Hidden Beach should be taken in the Critical Zone as well, to discourage visitors from entering the beach in this area. If piping plovers return to the area prior to project implementation, the seasonal restriction on construction discussed above will also be in effect in the Critical Zone. Additional steps may be necessary to avoid take in the Critical Zone because there is no seawall to block visitors from the birds' line-of-sight. If piping plovers nest within 50 meters of the completed pathway, the path would need to be closed or re-routed during the nesting season, or a visual and noise barrier (*i.e.*, a high dune) would be needed between the path and the nesting area.

For the remaining nesting areas, no potential exists for direct impacts to the piping plover from the Pathways Project as no proposed pathway routes pass directly behind the South Gunnison, Gunnison Beach Center, North Gunnison, North Beach, or U.S. Coast Guard nesting areas. However, there is potential for indirect impacts to piping plovers in these areas if the pathway design facilitates access or encourages visitor use of these areas.

South Gunnison

A pathway route that follows Atlantic Avenue instead of continuing on Hartshorne Road to Fort Hancock is likely to indirectly affect piping plovers. Visitors are known to make unauthorized use of pathways to access the South Gunnison beach from Atlantic Avenue (J. MacArthur, pers. comm.). Therefore, directing increased pedestrian and bicycle traffic to Atlantic Avenue can be expected to increase visitor entry into the closed South Gunnison nesting area, potentially impacting piping plover reproductive success. To avoid this situation, the Service recommends routing the pathway along Hartshorne Road instead of Atlantic Avenue. If the path is routed along Atlantic Avenue, signs, fencing, and monitoring will be necessary to prevent unauthorized visitor access to the South Gunnison nesting area.

Gunnison Beach Center

Although piping plovers have used this area, Gunnison Beach Center is a major developed recreational beach center. Therefore, directing visitors to the Gunnison Beach Center via the pathway is clearly appropriate. Focusing visitor use in developed beach centers can help redirect disturbances from other nesting areas with greater numbers of piping plovers. The Service recommends continued monitoring of the Gunnison Beach Center area for piping plover use, and continued adherence to Service guidance, including placing symbolic fencing around any nests, and the use of piping plover wardens to educate and inform visitors about the birds.

North Gunnison

An opportunity exists to use the pathway to help direct visitors away from the North Gunnison nesting area. Visitors parking in Lot K must walk down Atlantic Avenue, with vehicle traffic, to reach the Gunnison Beach Center. Many visitors attempt to walk down the beach through the closed North Gunnison piping plover nesting area instead of using Atlantic Avenue (J. MacArthur, pers. comm.). From Fort Hancock, a pathway route that provides a pedestrian connection between Lot K and the Gunnison Beach Center, without the safety hazard associated with walking on Atlantic Avenue, may help prevent visitors from attempting to walk through the piping plover nesting area. Redirection could be enhanced by signs at Lot K and along the path alerting visitors that the beach is closed north of the Gunnison Beach Center. The Service recommends that the path loop back to Fort Hancock from the Gunnison Beach Center to avoid indirect impacts to piping plovers at South Gunnison as discussed above.

U.S. Coast Guard and North Beach

Limited recreational opportunities are available in the U.S. Coast Guard and North Beach areas; consequently, large numbers of piping plovers nest in these areas. The Service recommends against extending the path north of Lot K. If the path continues north of Lot K, the Service recommends against any design that would encourage or facilitate increased visitor use of the U.S. Coast Guard or North Beach areas.

NORTHEASTERN BEACH TIGER BEETLE

The federally listed (threatened) northeastern beach tiger beetle *(Cicindela dorsalis dorsalis)* is present in the U.S. Coast Guard and North Beach areas. This beetle was historically found along New Jersey's Atlantic beaches from Sandy Hook to Holgate, but was extirpated from the State by the 1950s. Recovery efforts for this species include restoration of beetles to portions of their former range. Beginning in October 1994, the northeastern beach tiger beetle was reintroduced to New Jersey with a release of larvae at the U.S. Coast Guard and North Beach sites.

Northeastern beach tiger beetles inhabit the intertidal zone of wide, sandy ocean beaches. Adults prey and scavenge on amphipods, flies, and other beach arthropods along the water's edge. Eggs are deposited in the mid- to above-high tide drift zone. Larval beetles occur in a relatively narrow band of the upper intertidal to high drift zone, taking nearly two years to develop from eggs to adults. Larvae dig vertical burrows in the sand and wait at the burrow mouth to capture passing prey, primarily small amphipods. The primary threat to the northeastern beach tiger beetle is habitat disturbance and destruction from development, beach stabilization activities, and recreational beach uses including pedestrian and vehicle traffic, all of which affect the larvae. Other threats include spills of oil or other contaminants, pesticide use, natural or human-induced beach erosion, and natural factors such as predation and storms.

The same recommendations to discourage visitor use of the U.S. Coast Guard and North Beach sites to avoid adverse impact to piping plovers apply for the northeastern beach tiger beetle as well.

Except for the above-mentioned species and an occasional transient bald eagle (*Haliaeetus leucocephalus*) or roseate tern (*Sterna dougallii*), no other federally listed or proposed threatened or endangered flora or fauna are known to occur within the vicinity of the proposed project. If additional information on listed and proposed species becomes available, or if project plans change, this determination may be reconsidered. Current information regarding federally listed and candidate species occurring in New Jersey is enclosed.

STATE-LISTED AND OTHER SPECIES OF CONCERN

The Service understands that occurrences of State-listed species have been recorded at Sandy Hook, including the State-listed (threatened) osprey (*Pandion haliaetus*) and black-crowned night heron (*Nycticorax nycticorax*), and endangered plant species. Addresses of State agencies that

may be contacted for current site-specific information regarding State-listed species are enclosed. The Service encourages the NPS to consult with the New Jersey Natural Heritage Program and the New Jersey Endangered and Nongame Species Program to avoid adverse impacts to State-listed and other species of concern from the Pathways Project.

CONCLUSION

Federally listed threatened and endangered species and their habitats are afforded protection under Section 7(a)(2) of the ESA, which requires every federal agency, in consultation with the Service, to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. An assessment of potential direct, indirect, and cumulative impacts is required for all federal actions that may affect listed species. The Service understands that the proposed Pathways Project is still in the early stages of the planning process. We look forward to working with the NPS in ongoing informal consultation to avoid adverse impacts from the Pathways Project to the piping plover and the northeastern beach tiger beetle. Please contact Wendy Walsh of my staff at (609) 646-9310, extension 48 if you have any questions or require further assistance regarding federally listed endangered or threatened species.

Sincerely,

Clifford G. Day
Supervisor

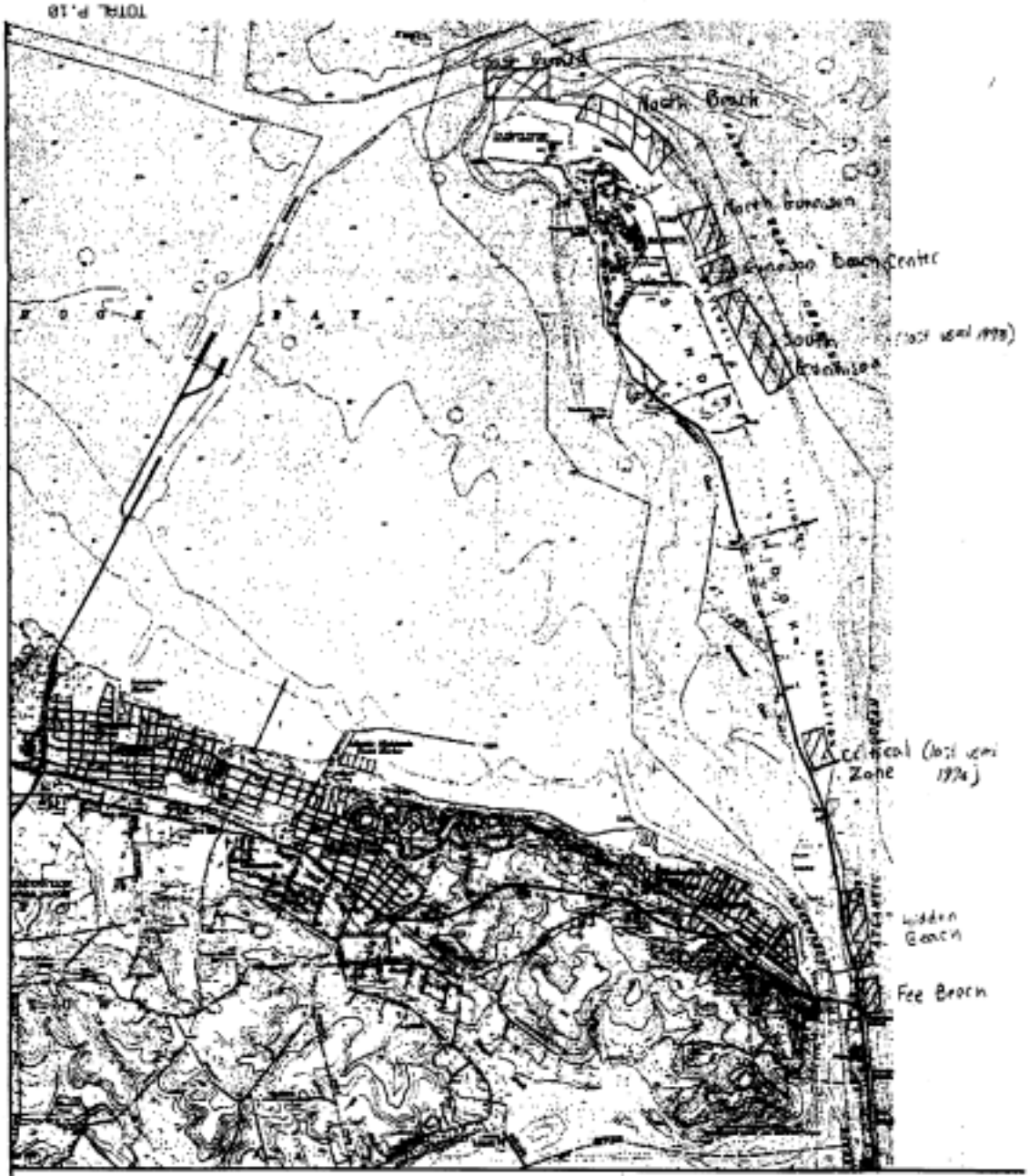
Enclosures

Literature Cited

U.S. Fish and Wildlife Service. 1996. Piping Plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan. Hadley, Massachusetts. 258 pp.

Personal Communication

Jean MacArthur. 2000. Natural Resources Staff, Sandy Hook Unit, National Park Service, Gateway National Recreation Area, Sandy Hook, New Jersey.



Name: SANDY HOOK
Date: 5/24/100
Scale: 1 inch equals 4000 feet

Location: 040° 25' 58.8" N 074° 00' 53.5" W
Caption: Piping Plover Nesting Areas at Sandy Hook

APPENDIX B: NEW JERSEY COASTAL PROGRAM CONSISTENCY REVIEW

Coastal Zone Management Program

Gateway National Recreation Area
Sandy Hook Unit
Multiuse Pathway

Chapter 7:7E-3.42 Excluded Federal Lands states that Federal actions on excluded Federal lands that significantly affect the coastal zone (spillover effects) shall be consistent with the Coastal Resource and Development Policies, to the maximum extent practicable.

NPS has reviewed NJDEP regulations regarding federal consistency with the NJ Coastal Management Program. The following excerpts address how NPS evaluates the project for consistency. NPS has submitted the environmental assessment to which this Consistency Review is attached for concurrence.

The following program areas relate to this project. NPS believes the project is consistent with the Coastal Management Program:

Subchapter 6. General Location Rules

7:7E-6.1 Rule on location of linear development

(a) A linear development, such as but not limited to a road, sewer line, public walkway or offshore pipeline, that must connect two points to function shall comply with the specific location rules to determine the most acceptable route, to the maximum extent practicable. If part of the proposed alignment of a linear development is found to be unacceptable under the specific location rules, that alignment (perhaps not the least possible distance) may nonetheless be acceptable, provided the following conditions are met:

1. There is no prudent or feasible alternative alignment that would have less impact on sensitive areas;

2. There will be no permanent or long-term loss of unique or irreplaceable areas;

3. Appropriate measures will be used to mitigate adverse environmental impacts to the maximum extent feasible, such as restoration of disturbed vegetation, habitats, and land and water features; and

4. The alignment is located on or in existing transportation corridors and alignments, to the maximum extent practicable.

The multiuse pathway alignment is consistent with the rule on location of linear development.

7:7E-6.2 Basic location rule

(a) A location may be acceptable for development under the specific location regulations in N.J.A.C. 7:7E-6.1, but the DEP may reject or conditionally approve the proposed development of the location as reasonably necessary to:

1. Promote the public health, safety, and welfare;

2. Protect public and private property, wildlife and marine fisheries; and

3. Preserve, protect and enhance the natural environment.

The alignment of the multiuse pathway appears to meet the basic location rule.

7:7E-6.3 Secondary impacts

(a) Secondary impacts are the effects of additional development likely to be constructed as a result of the approval of a particular proposal. Secondary impacts can also include traffic increases, increased recreational demand, and any other offsite impacts generated by onsite activities that affect the site and surrounding region.

(b) Coastal development that induces further development shall demonstrate, to the maximum extent practicable, that the secondary impacts of the development will satisfy the Rules on Coastal Zone Management. The level of detail and areas of emphasis of the secondary impact analysis are expected to vary depending upon the type of development. Minor projects may not even require such an analysis. Transportation and wastewater treatment systems are the principal types of development that require a secondary impact analysis, but major industrial, energy, commercial, residential, and other projects may also require a rigorous secondary impact analysis.

1. Secondary impact analysis must include an analysis of the likely geographic extent of induced development, its relationship to the State Development and Redevelopment Plan, an assessment of likely induced point and non-point air and water quality impacts, and evaluation of the induced development in terms of all applicable Rules on Coastal Zone Management.

The multiuse pathway is unlikely to induce secondary impacts such as induced development.

Subchapter 7. Use Rules

7:7E-7.1 Purpose

Many types of development seek locations in the coastal zone. The second stage in the screening process of the Rules on Coastal Zone Management spells out a set of rules for particular uses of coastal resources. Use rules are rules and conditions addressed to particular kinds of development. Use rules do not preempt location rules that restrict development, unless specifically stated. In general, they introduce conditions which must be satisfied in addition to the Location rules (N.J.A.C. 7:7E-2 through 6), and the Resource rules described in the following subchapter (N.J.A.C. 7:7E-8).

7:7E-7.3 Resort Recreational Use

(a) "Resort/recreation uses" include the wide range of small and large developments attracted to and often dependent upon locations along the coast. These uses include hotels, motels, marinas, boating facilities, campgrounds, amusement piers, parks and recreational structures such as bathhouses, natural areas, open space for active and passive recreation, and linear paths for bicycling and jogging (see N.J.A.C. 7:7E-7.10 and N.J.A.C 7:7E-5.5(d)).

(b) Standards relevant to recreation priority are as follows:

1. Each waterfront municipality should contain at least one waterfront park on each body of water within the municipality. Municipalities that do not currently provide, or have active plans to provide, access to the water will not be eligible for Green Acres or Shore Protection Bond Funding.

2. Resort/recreation uses and commercial fisheries uses shall have priority over all other uses in Monmouth, Ocean, Atlantic, and Cape May counties with highest priority reserved for those uses that serve a greater rather than a lesser number of people, and those uses that provide facilities for people of all ages and for people with physical handicaps.

(c) Standards relevant to recreation areas within developments are as follows:

1. "Recreation areas" include a variety of types and sizes of open space adequate to accommodate appropriate recreational activities or facilities.

The multiuse pathway is consistent with resort/recreation uses identified in this section.

7:7E-7.5 Transportation Use Policies

(c) Standards relevant to bicycle and foot paths are as follows:

1. The construction of internal bicycle paths, foot paths and side-walks in residential, commercial, and industrial developments is required to the maximum extent practicable.

2. Linear bicycle and foot paths are encouraged along the edges of all water bodies, and from the water body to the nearest public road, provided they would not disturb Special Areas or subject the user to danger.

3. Existing bicycle and foot paths shall be continued around development when it is not practical to pass through development.

The multiuse pathway for Sandy Hook is outside residential, commercial, or industrial development.

Subchapter 8. Resource Policies

7:7E-8.1 Purpose

(a) The third step in the screening process of the Rules on Coastal Zone Management involves a review of a proposed development in terms of its effects on various resources of the built and natural

environment of the coastal zone, both at the proposed site as well as in its surrounding region. These rules serve as standards to which proposed development must adhere.

(b) In addition to the standards addressed in this subchapter, proposed development must also adhere to applicable site development standards administered by other State and local agencies. These include, but are not limited to, standards adopted by local Soil Conservation Districts or municipalities pursuant to the Soil and Sediment Control Act (N.J.S.A. 4:24-39 et seq.); Barrier Free Design Requirements promulgated by the New Jersey Department of Community Affairs pursuant to N.J.S.A. 52:32.1 et seq. and N.J.S.A. 52:27D-123 and N.J.A.C. 5:23-3.2 and 5:23-3.14, the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq.; the Freshwater Wetlands Protection Act, N.J.S.A. 13:9B-1 et seq. and its implementing regulations set forth at N.J.A.C. 7:7A.

7:7E-8.2 Marine Fish and Fisheries

(a) Coastal actions are conditionally acceptable to the extent that minimal feasible interference is caused to the natural functioning of marine fish and fisheries, including the reproductive and migratory patterns of estuarine and marine estuarine-dependent species of finfish and shellfish.

The multiuse pathway for Sandy Hook would have no effect on marine Fish and fisheries.

7:7E-8.4 Water Quality

(a) As required by Section 307(f) of the Federal Coastal Zone Management Act (P.L. 92-583), Federal, State and local water quality requirements established under the Clean Water Act 33 U.S.C. 1251 shall be the water resource standards of the coastal management program. These requirements include not only the minimum requirements imposed under the Clean Water Act but also the additional requirements adopted by states, localities, and interstate agencies pursuant to Section 510 of the Clean Water Act and such statutes as the New Jersey Water Pollution Control Act. In the Delaware River Basin, the requirements include the prevailing "Basin Regulations-Water Quality" adopted by the Delaware River Basin Commission as part of its Comprehensive Plan. In the waters under the jurisdiction of the Interstate Sanitation Commission in the New Jersey-New York metropolitan area, the requirements include the Interstate Sanitation Commission's Water Quality Regulations. Department rules related to water pollution control and applicable throughout the entire coastal zone include, for example, the Surface Water Quality Standards (N.J.A.C. 7:9-4), the rules concerning Wastewater Discharge Requirements (N.J.A.C. 7:9-5), the Ground-Water Quality Standards (N.J.A.C. 7:9-6), and the Regulations Concerning the New Jersey Pollutant Discharge Elimination System (N.J.A.C. 7:14A).

(b) Coastal development which would violate the Federal Clean Water Act, or State laws, rules and regulations enacted or promulgated pursuant thereto, is prohibited. In accordance with N.J.A.C. 7:15 concerning the Water Quality Management Planning and Implementation process, coastal development that is inconsistent with an approved Water Quality Management (208) Plan under the New Jersey Water Quality Planning Act, N.J.S.A. 58:11A-1 et seq., is prohibited.

The multiuse pathway for Sandy Hook would not result in the discharge of pollutants to surface or ground water and would have no effect on water quality. Construction would include the use of Best Management Practices recommended by NJDEP to prevent soil movement that could be carried by wind or water to surface water areas.

7:7E-8.5 Surface Water Use

(a) Surface water is the water in lakes, ponds, streams, rivers, bogs, wetlands, bays, and ocean that is visible on land.

(b) Coastal development shall demonstrate that the anticipated surface water demand of the facility will not exceed the capacity, including phased planned increases, of the local potable water supply system or reserve capacity and that construction of the facility will not cause unacceptable surface water disturbances, such as drawdown, bottom scour, or alteration of flow patterns.

There would be no surface water diversion associated with the multiuse pathway for Sandy Hook.

7:7E-8.6 Groundwater Use

(a) Groundwater is all water within the soil and subsurface strata that is not at the surface of the land. It includes water within the earth that supplies wells and springs.

(b) Coastal development shall demonstrate, to the maximum extent practicable, that the anticipated groundwater withdrawal demand of the development, alone and in conjunction with other groundwater diversions proposed or existing in the region, will not cause salinity intrusions into the groundwaters of the zone, will not degrade groundwater quality, will not significantly lower the water table or piezometric surface, or significantly decrease the base flow of adjacent water sources. Groundwater withdrawals shall not exceed the aquifer's safe yield.

1. Coastal development shall conform with all applicable DEP and, in the Delaware River Basin, Delaware River Basin Commission requirements for groundwater withdrawal and water diversions.

There would be no additional groundwater diversion associated with the multiuse pathway for Sandy Hook.

7:7E-8.7 Stormwater Management

(a) Stormwater runoff is the flow of water on the surface of the ground, resulting from precipitation.

(b) Coastal development shall employ a site design which, to the extent feasible, minimizes the amount of impervious coverage on a project site. In addition, the development shall use the best available technology to minimize the amount of stormwater generated, minimize the rate and volume of off-site stormwater runoff, maintain existing on-site infiltration, simulate natural drainage systems and minimize the discharge of pollutants to ground or surface waters. Consistent with the provisions of the Stormwater Management rule, the overall goal of the post-construction stormwater management system design shall be the reduction from the predevelopment level of total suspended solids (TSS) and soluble contaminants in the stormwater.

1. Non-structural management practices, including, but not limited to, cluster land use development, minimum site disturbance, open space acquisition, use of sheet flow from streets and parking areas, and the protection of wetlands, steep slopes and vegetation shall be incorporated into project designs. These non-structural management practices shall be utilized, unless it is demonstrated that these practices are not feasible, from an engineering perspective, on a particular site.

2. In determining the appropriate stormwater management system design for a particular project, the existing physical site conditions must be carefully considered. Slopes, depth to seasonal high water table, soil type and texture, watershed area, and property areas are all critical to the selection of a suitable stormwater management technique or combination of techniques.

The multiuse pathway would not contribute to stormwater runoff. The soil in the project area is very pervious and would not result in the transport of soil particles or pollutants to ground or surface waters.

7:7E-8.8 Vegetation

(a) "Vegetation" is the plant life or total plant cover that is found on a specific area, whether indigenous or introduced by humans.

(b) Coastal development shall preserve, to the maximum extent practicable, existing vegetation within a development site. Coastal development shall plant new vegetation, particularly appropriate native coastal species, to the maximum extent practicable.

The development of the multiuse pathway requires the conversion of vegetation for other use. The area lost is a very small percentage of the total area of Sandy Hook. Additional development is not anticipated.

7:7E-8.10 Air Quality

(a) The protection of air resources refers to the protection from air contaminants that injure human health, welfare or property, and to attainment and maintenance of State and Federal air quality goals and the prevention of degradation of current levels of air quality.

(b) Coastal development shall conform to all applicable State and Federal regulations, standards and guidelines and be consistent with the strategies of New Jersey's State Implementation Plan (SIP). See N.J.A.C. 7:27 and New Jersey SIP for ozone, particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, lead, and visibility.

(c) Coastal development shall be located and designed to take full advantage of existing or planned mass transportation infrastructures and shall be managed to promote mass transportation services, as required under the Traffic Policy (N.J.A.C. 7:7E-8.14(b))

The multiuse pathway would connect with the ferry serving Sandy Hook. This service reduces the dependence of individual vehicles and would be consistent with the strategies to improve air quality.

7:7E-8.11 Public Access to the Waterfront

(a) Public access to the waterfront is the ability of all members of the community at large to pass physically and visually to, from and along the ocean shore and other waterfronts.

(b) Coastal development adjacent to all coastal waters, including both natural and developed waterfront areas, shall provide permanent perpendicular and linear access to the waterfront to the

maximum extent practicable, including both visual and physical access. Development that limits public access and the diversity of the waterfront experiences is discouraged.

The multiuse pathway for Sandy Hook would enhance access to coastal waters by providing an alternate means of access.

7:7E-8.12 Scenic Resources and Design

(a) Scenic resources include the views of the natural and/or built landscape.

(b) Large-scale elements of building and site design are defined as the elements that compose the developed landscape such as size, geometry, massing, height and bulk structures.

(c) New coastal development that is visually compatible with its surroundings in terms of building and site design, and enhances scenic resources is encouraged. New coastal development that is not visually compatible with existing scenic resources in terms of large-scale elements of building and site design is discouraged.

(d) In all areas, except the Northern Waterfront region, the Delaware River Region and Atlantic City, new coastal development adjacent to a bay or ocean or bayfront or oceanfront, beach, dune or boardwalk and higher than 15 feet in height measured from the existing grade of the site or boardwalk shall:

1. Provide an open view corridor perpendicular to the water's edge in the amount of 30 percent of the frontage along the waterfront where an open view currently exists; and

2. Be separated from either the beach, dune, boardwalk, or waterfront, whichever is further inland, by a distance of equal to two times the height of the structure. However, exceptions may be made for infill sites within existing commercial areas along a public boardwalk where the proposed use is commercial and where the set-back requirement is visually incompatible with the existing character of the area.

(e) Rationale: A project which is of a scale and location that has significant effect on the scenic resources of a region is considered to have a regional impact and to be of State concern. This rule, applies only to developments which by their singular or collective size, location and design could have a significant adverse effect on the scenic resources of the coastal zone. Restoration of areas of low scenic quality, such as abandoned port facilities and blighted urban areas, through large-scale new construction and design that is compatible with the surrounding region, is also encouraged by this rule. Specific issues of concern include those addressed by the rules on Historic and Archaeological Resources, High Rise Structure, Public Access, and Buffers and Compatibility of Uses.

The Sandy Hook multiuse pathway would be a small-scale development compatible with the scenic quality of the area.

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LIST OF PREPARERS

Denver Service Center Denver Colorado	
Hugh Duffy	Landscape Architect
Chris Davis	Natural Resource Specialist
Patrick Kenney	Natural Resource Specialist
David Lee	Natural Resource Specialist
Eric Petersen	Cultural Resource Specialist
Jac Roberson	Civil Engineer
Carol Whipple	Project Manager
Steve Whissen	Cultural Resources Specialist
Gateway National Recreation Area Sandy Hook Unit	
Rick Dorrance	Landscape Architect
George Frame	Ecologist
Bruce Lane	Natural Resources Specialist
Dana Linck	Archeologist
Lou Venuto	Chief, Interpretation and Cultural Resources
Richard Wells	Deputy Superintendent

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